

Models:

A5ACV 30 CR  
A5ACV 55 CR  
A5ACV 75 CR  
A5ACV 100 CR  
A5ACV 135 CR  
A5ACV 210 CR

**ACSON**<sup>®</sup>  
International

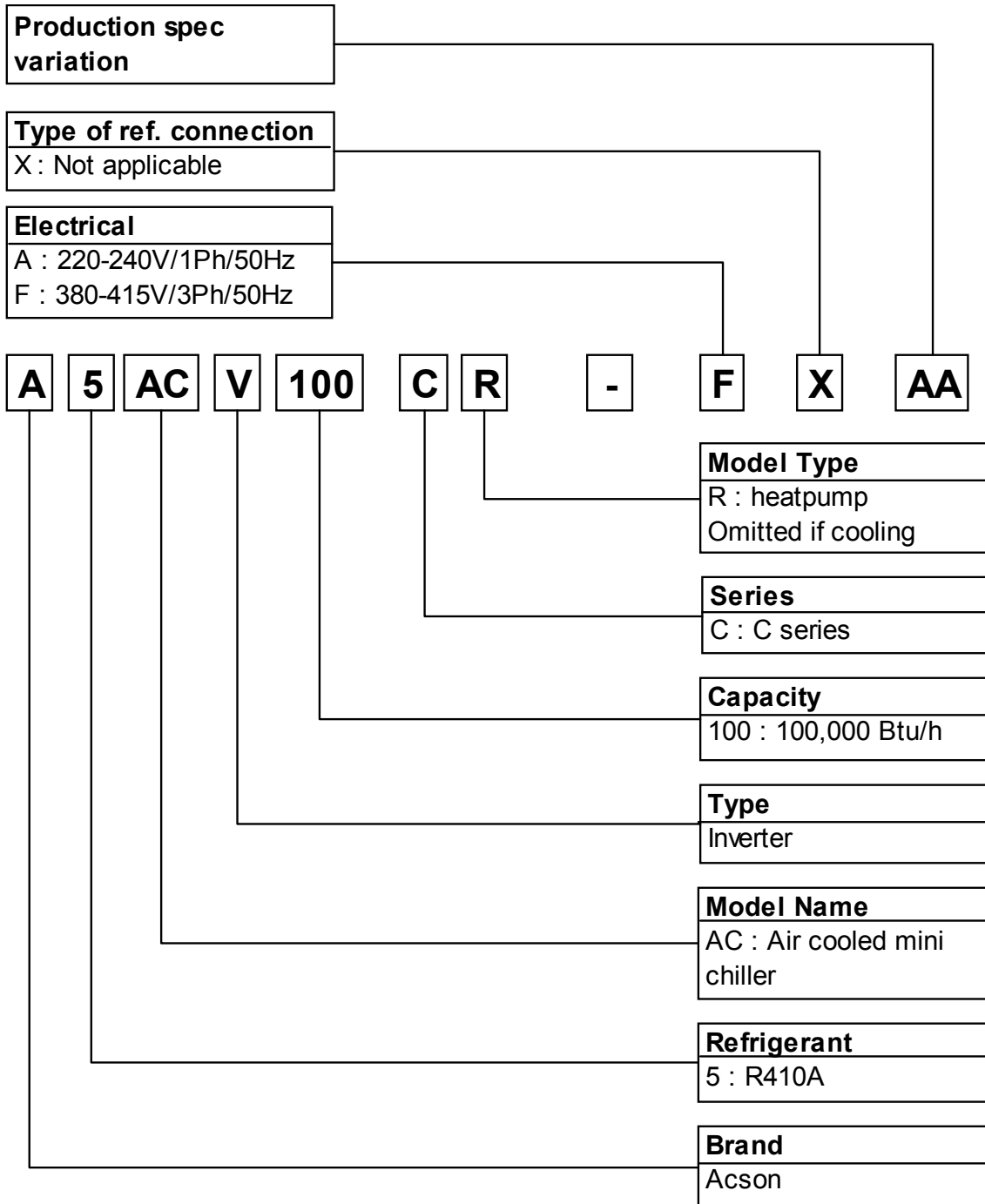


**Air-Cooled Chiller  
(R410A Inverter Series)**

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# 1. NOMENCLATURE



## PRODUCT LINE UP

### A5ACV PRODUCT LINE-UP

|       | Heat pump model | Nomenclature | Classification     |          |                 |                |                   |                                 |                                            |                        |                                 |           |                          |                      |                          |
|-------|-----------------|--------------|--------------------|----------|-----------------|----------------|-------------------|---------------------------------|--------------------------------------------|------------------------|---------------------------------|-----------|--------------------------|----------------------|--------------------------|
|       |                 |              | Wired handset WCCH | Gold Fin | Isolator Switch | Terminal block | Scroll compressor | Capillary tube (Normal circuit) | Capillary tube (Normal & Inverter circuit) | EXV (Inverter circuit) | EXV (Normal & Inverter circuit) | Pump only | Brass adaptor BSPT 1 1/4 | Brass adaptor BSPT 1 | Brass adaptor BSPT 1 1/2 |
| A5ACV | 30CR            | AXAA         | X                  | X        |                 | X              | X                 |                                 |                                            | X                      |                                 | X         |                          | X                    |                          |
|       | 55CR            | FXAA         | X                  | X        |                 | X              | X                 |                                 |                                            | X                      |                                 | X         |                          | X                    |                          |
|       | 75CR            | FXAA         | X                  | X        |                 | X              | X                 |                                 |                                            | X                      |                                 | X         |                          | X                    |                          |
|       | 100CR           | FXAA         | X                  | X        | X               |                | X                 | X                               |                                            | X                      |                                 | X         | X                        |                      |                          |
|       | 135CR           | FXAA         | X                  | X        | X               |                | X                 | X                               |                                            | X                      |                                 | X         | X                        |                      |                          |
|       | 210CR           | FXAA         | X                  | X        | X               |                | X                 |                                 | X                                          |                        | X                               | X         |                          |                      | X                        |

## 2. FEATURES

### **TRUE DUAL CIRCUITS BPHE**

The true dual BPHE puts the secondary circuit (water) in contact with 2 primary circuits (refrigerant). So even if one primary circuit is shut off, each secondary channel is still in contact with a primary channel.

### **INVERTER COMPRESSOR**

Inverter compressor is programmed to run at the optimum speed, which is regulated by the input frequency as it can vary according to the heat load requirement.

Inverter advantages are :

- Less start & stop – Frequency regulated compressor resulting in lesser in the sense of start and stop of compressor, which greatly reduces the energy consumption.
- Fast cooling/heating – Inverter compressor has the ability to produce faster cooling/heating capacity at the frequency higher than the dominant capacity frequency.
- Smart loading/unloading – with the integration of built in system algorithm; inverter compressor could control the system's loading and unloading sophisticatedly.
- Better compressor reliability – Reliability of inverter compressor is always better since there is lesser on/off of the system especially during low load condition.

### **ELIMINATION OF WATER TANK**

Inverter system provides constant water temperature band, or much lesser water temperature fluctuation. With this, water tank of the mini chiller system can be eliminated.

### **BUILT IN FAN SPEED**

The built in algorithm now controls fan speed, resulting in cost saving since installation of external FSC (Fan speed controller) can be exempted.

### **SAFETY PROTECTION**

- High & low pressure switches
- Anti-freeze protection sensor
- Discharge temperature sensor
- Over pressure relief valve
- Water pressure differential switch
- Anti-freeze heater on BPHE
- Compressor, water pump overload protector

### **ANTI CORROSION HEAT EXCHANGER**

Gold aluminum fin is offered as standard material of the condenser heat exchanger of this series of chiller.

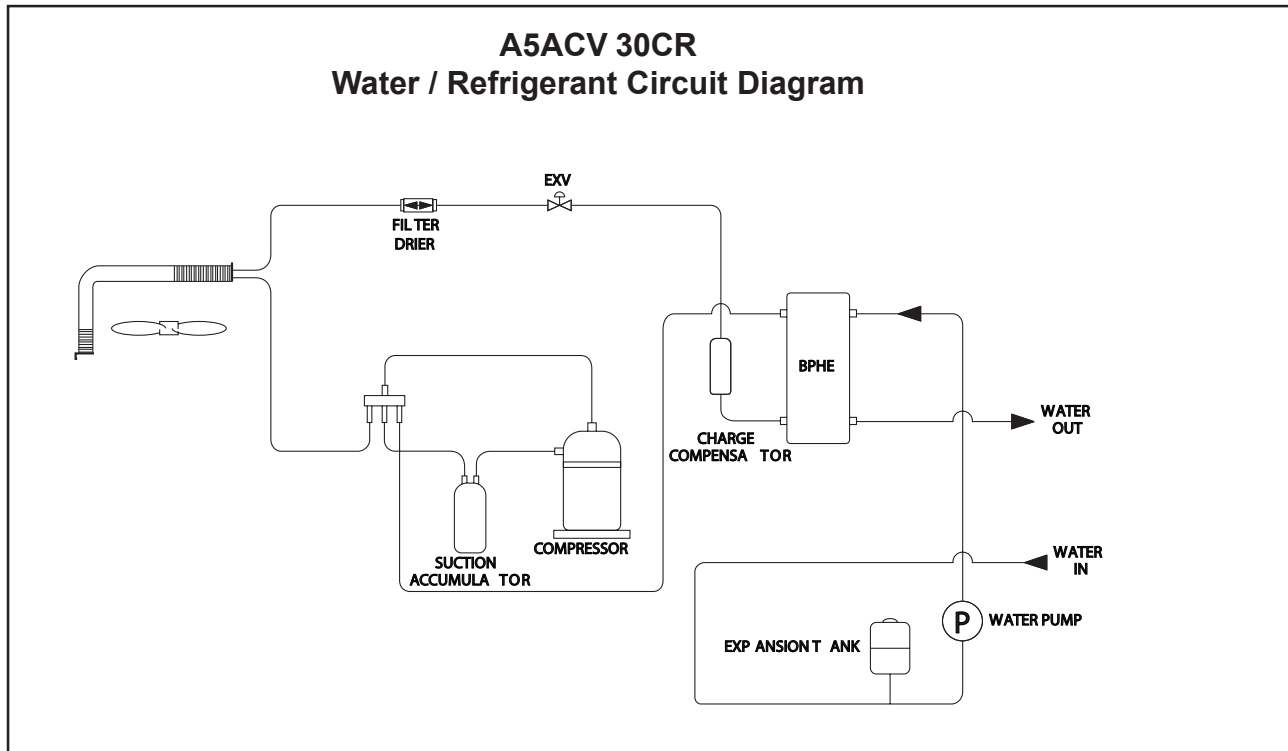
### **MODULAR INSTALLATION**

A network up to 50 chillers in a system is possible. Control on the operation of the chillers will be done through the microprocessor controller. The external water piping connection can be made either from the left or right side of the unit.

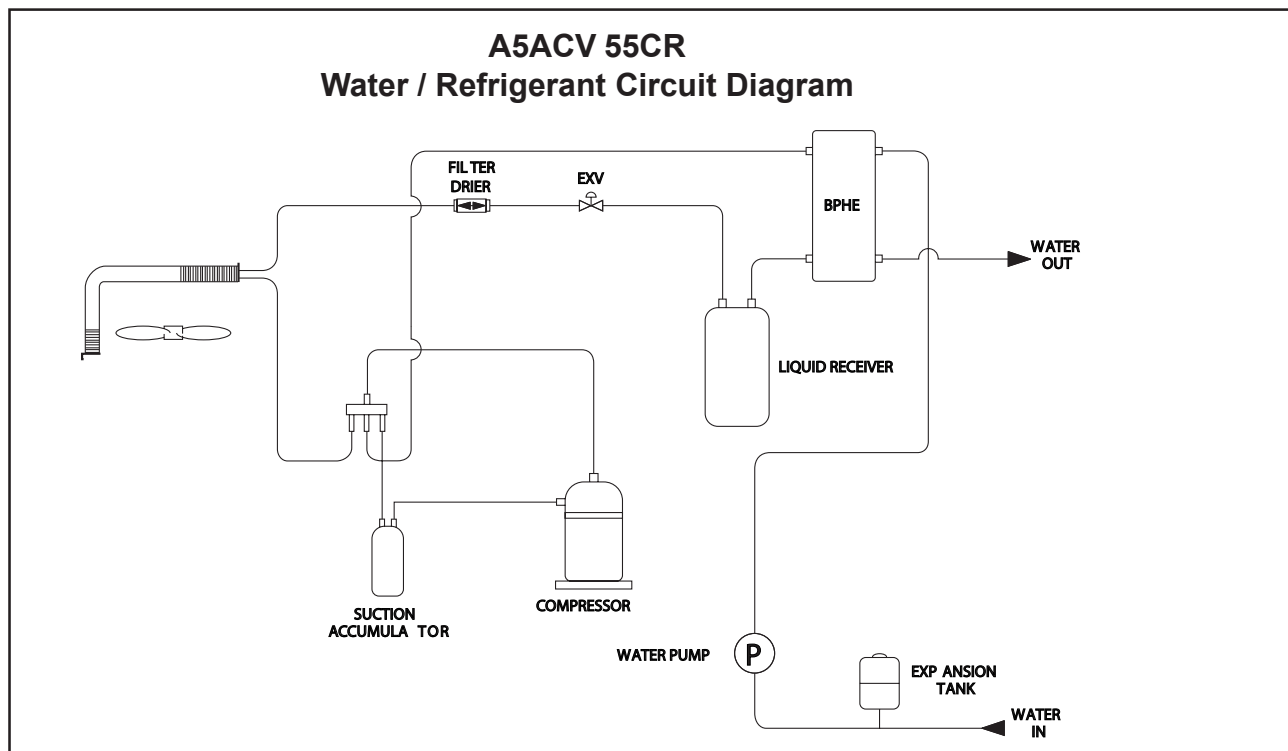
### 3. APPLICATION INFORMATION

#### REFRIGERANT CIRCUIT DIAGRAM

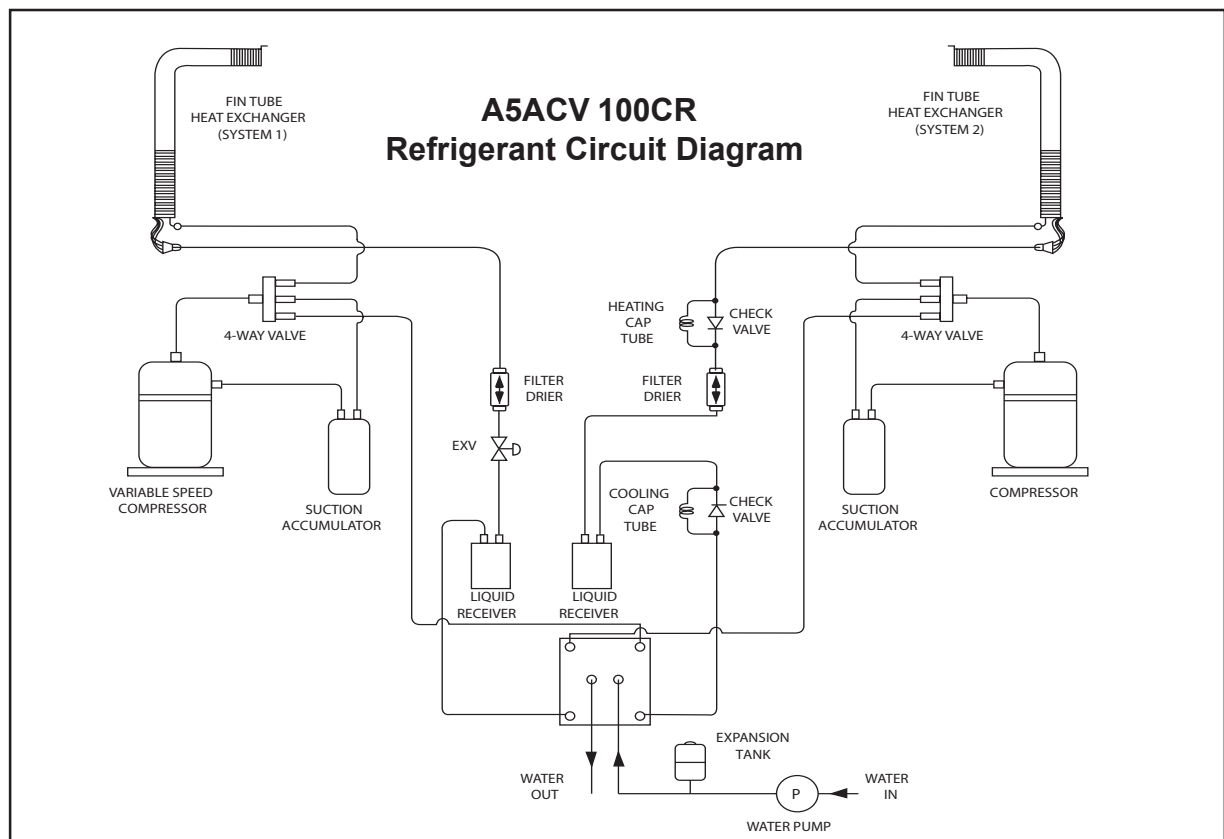
MODEL : A5ACV 30CR



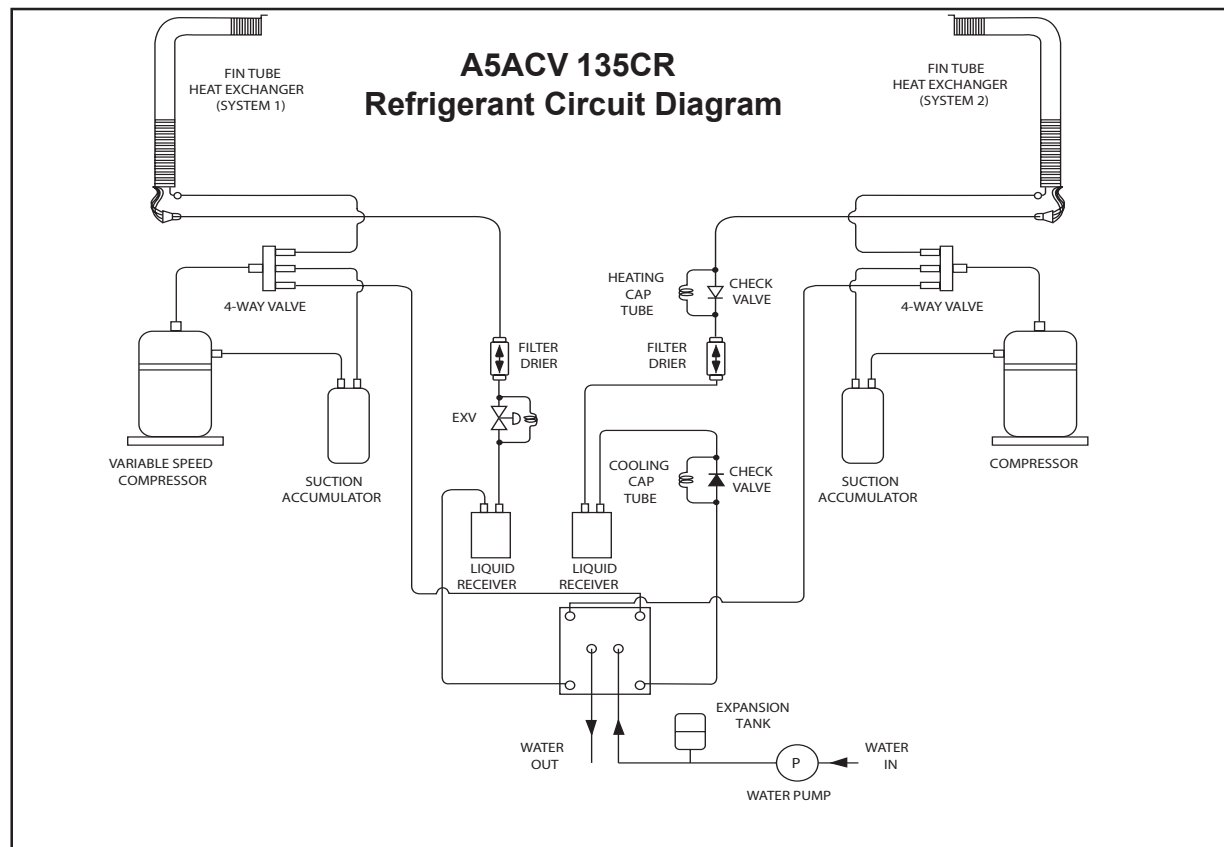
MODEL : A5ACV 55 / 75CR



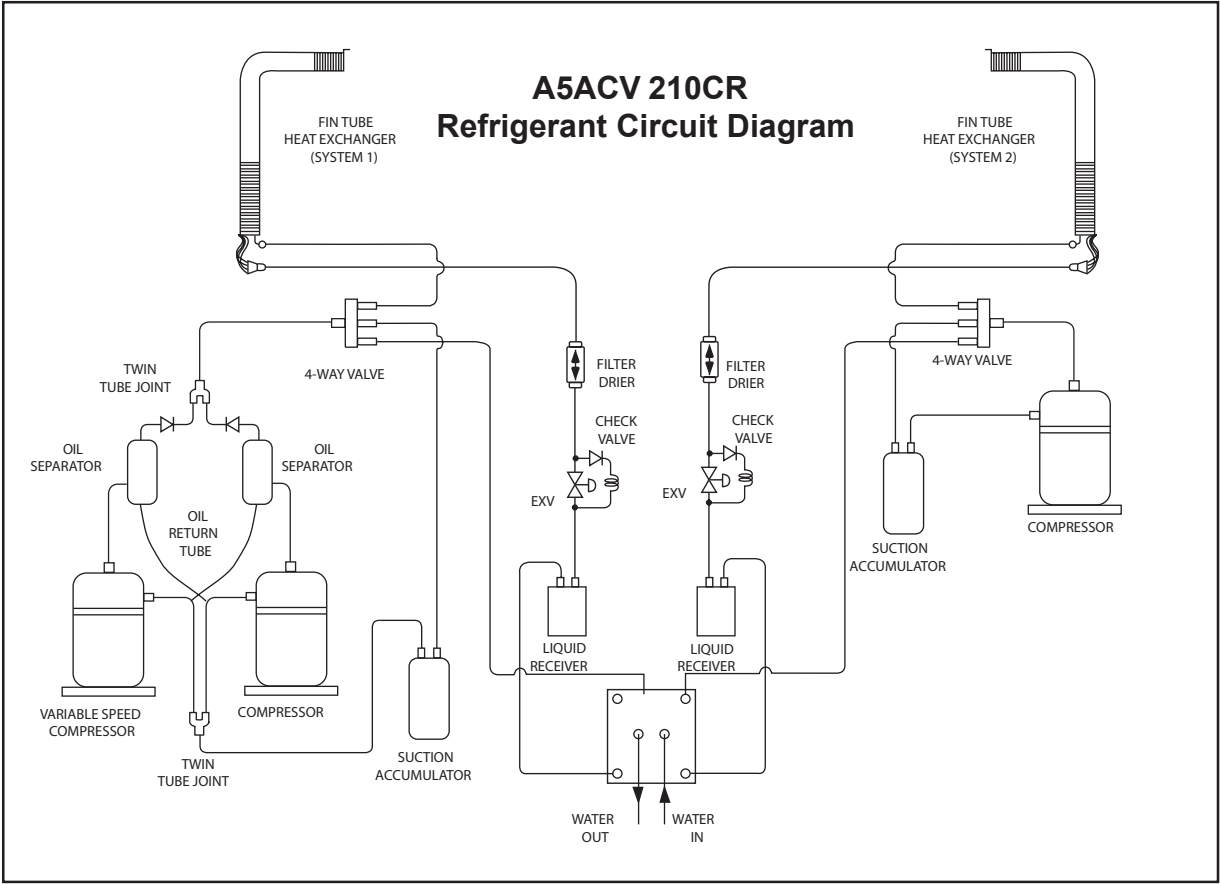
## MODEL : A5ACV 100CR



## MODEL : A5ACV 135CR



**MODEL : A5ACV 210CR**



# CHILLER PANEL CONTROLLER

## 1. SAFETY CONSIDERATION

Only specially trained and technicians and installers are authorized to install and service this equipment.

### 1.1 General Installation Recommendations

- Only supply DC voltage (9-17V, typically 12V, maximum current 200mA) as a power source to the device.
- Input contact voltage supply should limit to 12VDC or 24VAC.
- Isolated all the low voltage wiring (communication bus, etc) from high voltage power supply wiring.

## 2. GENERAL DESCRIPTION

### 2.1 General

The chiller panel controller is designed to control the chiller operation. This device allows the user to have customized control for each connected unit.

### 2.2 Features

The requirements of user friendly and easy to use have been taken into account in designing this chiller panel controller. It can do the task as follow:

- Whole system configuration
- Unique parameter settings
- Operation status display
- Tracing fault record (easy in hardware troubleshooting)

The display is shown in an 8-lines graphical LCD display. There are 8 dedicated keys available in the panel,

- Menu selection
- Navigation on the screen
- Modification of the selected value

During first start-up, the panel will have a default configuration (timer schedule, set point, miscellaneous settings, etc). User can do the changes on that particular configuration later.

### 2.3 Panel Position

The chiller panel controller can be installed anywhere, as long as it is easy to accessed by authorized personnel.

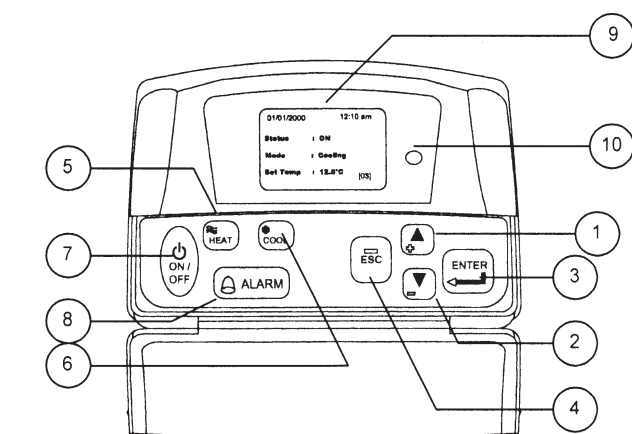
The requirements of installation are:

- Avoid exposure to shocks
- Avoid any source of electromagnetic pollution
- Avoid installation on uneven vertical surface

### 2.4 Operation Environmental Condition

- Temperature:
  - 10°C to 47°C operating temperature
  - 20°C to 85°C storage temperature
- Relative Humidity:
  - 0 to 95% non-condensing

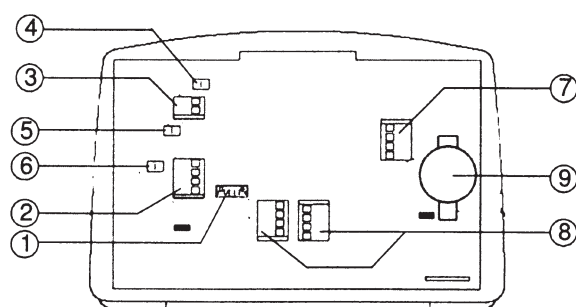
### 3. HARDWARE DESCRIPTION



Front View

#### Legend

|       |                                     |
|-------|-------------------------------------|
| 1 & 2 | Navigation key                      |
| 3     | Execute instruction key             |
| 4     | Cancel instruction key              |
| 5     | Switching to heat mode shortcut key |
| 6     | Switching to cool mode shortcut key |
| 7     | Toggle ON/OFF shortcut key          |
| 8     | Show alarm key                      |
| 9     | Graphical LCD display               |
| 10    | ON/OFF indicator                    |



Back View

#### Legend

|       |                                             |
|-------|---------------------------------------------|
| 1 & 2 | Chiller terminal unit connection            |
| 3     | Not available                               |
| 4     | CMOS reset jumper (JH2)                     |
| 5     | Chiller bus resistor or configuration (JH3) |
| 6     | Not available                               |
| 7     | Not available                               |
| 8     | Not available                               |
| 9     | Not available                               |
| 10    | Backup battery                              |

#### 3.1 Key Explanation



The 2 navigation keys permit item selection and modifying the selected value.



ENTER key is used to execute the navigation instruction



ESC key is used to cancel the navigation instruction



Shortcut key to switch the operation mode in the summary pages



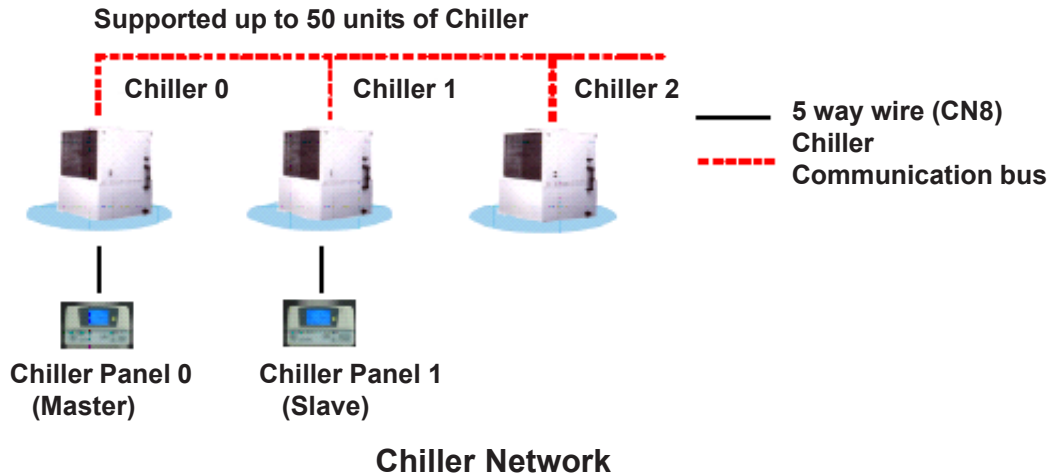
Shortcut key to trigger ON/OFF in the summary pages



Shortcut key to show fault / alarm in the summary pages

## 4. INSTALLATION

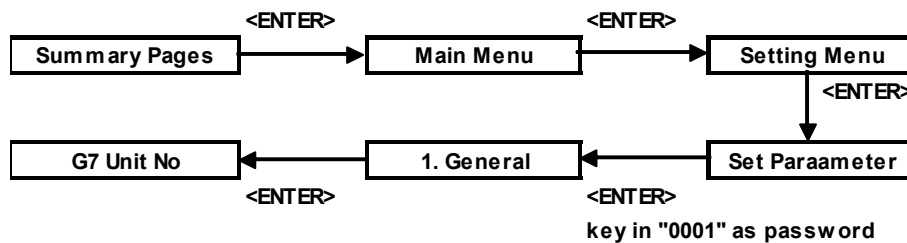
### 4.1 Chiller Bus



Chiller panel needs to be energized with +12Vdc. The 5 way wires that provided is once on the easiest solution to establish a communication between the panel and chiller main board (CN8-JP13). If the 5-way wires socket has been occupied in main board, just using 2 insulation wired are needed to establish a communication between panel and chiller main board.

Chiller panel can support maximum up to 50 units of chiller. In the chiller network, duplication of main board unit address is not allowed. Each chiller main board should have their unique unit address (0-50). For first time running, user need to assign a unique unit address to each main board in the chiller network. User should follow the procedure below:

- Only power ON one main board at once time. Make sure not others main boards are energized.
- By using the panel connected to the main board.



- Key in unique unit address and press ENTER to execute.
- De-energized the main board and repeat the procedures again all the main boards have been assigned a unique unit address.

**IMPORTANT : Do not assign a same unit address to more than one chiller main board.**

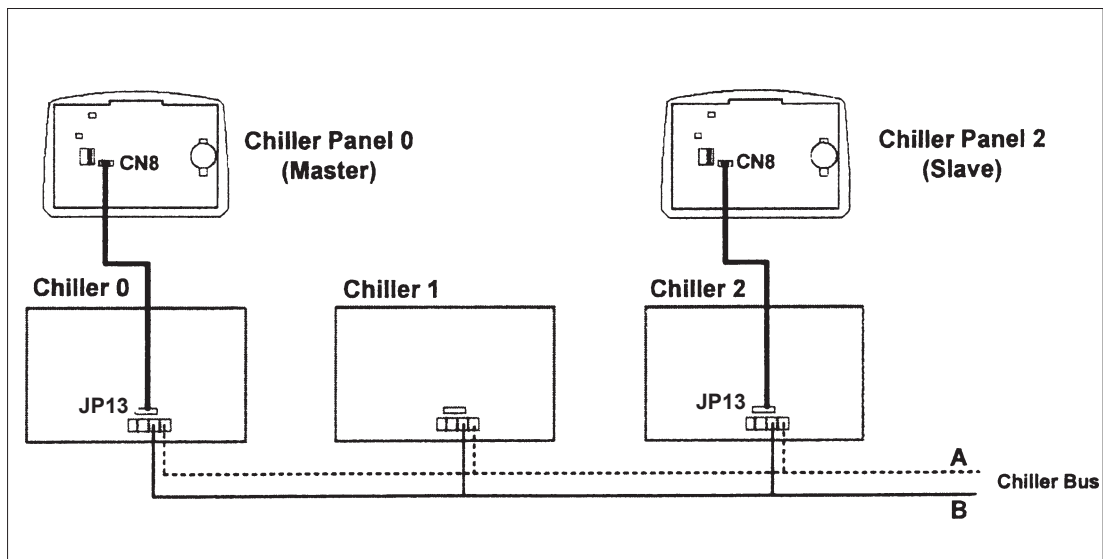
**RECOMMENDATION : Please select a coherent model (G1 Model) to all the chiller main boards in the same network.**

## 4.2 Others Configuration

- JH2 in chiller panel should let it open (put the jumper header on one pin only) all the time unless user need to do CMOS reset to that particular panel.
- JH3 should let it open (put the jumper header on one pin only) all the time as well.
- Remember to put in the coin cell battery on the panel. Without the backup battery, the panel will always reset the time to 12:00am, 1st Jan 2000.

## 4.3 Installation of Chiller Panel Controller

- Disconnect the unit and ensure no others unit energy source that supplies the panel.
- Open the rear panel of the Chiller Panel (insert a 'flat-head' screwdriver in the top joint of main casing with rear panel to open the rear panel).
- Pass the necessary wires of the panel across the large opening in the rear panel. Place the rear panel flat support against the wall and make marks on the wall through the four installation holes (inner and outer).
- Drill four appropriate holes in the marked places.
- Attach the rear panel to the wall and put on the screws on it. Ensure that all cables are passed through the hole of the rear panel.
- Connect the wires to the corresponding terminal according to the wiring bus network. The power supply and communication wires must be correctly connected to ensure that the panel works.
- Close the chiller panel (ensure the bottom joint is aligned for the casing, then complete others joint part. Ensure that the contacts at the back of the panel are aligned with each others).



**Bus Wiring Diagram**

## 5. SOFTWARE DESCRIPTION

### 5.1 Introduction

The Chiller Panel Controller can be used to control / display the status of Chiller.

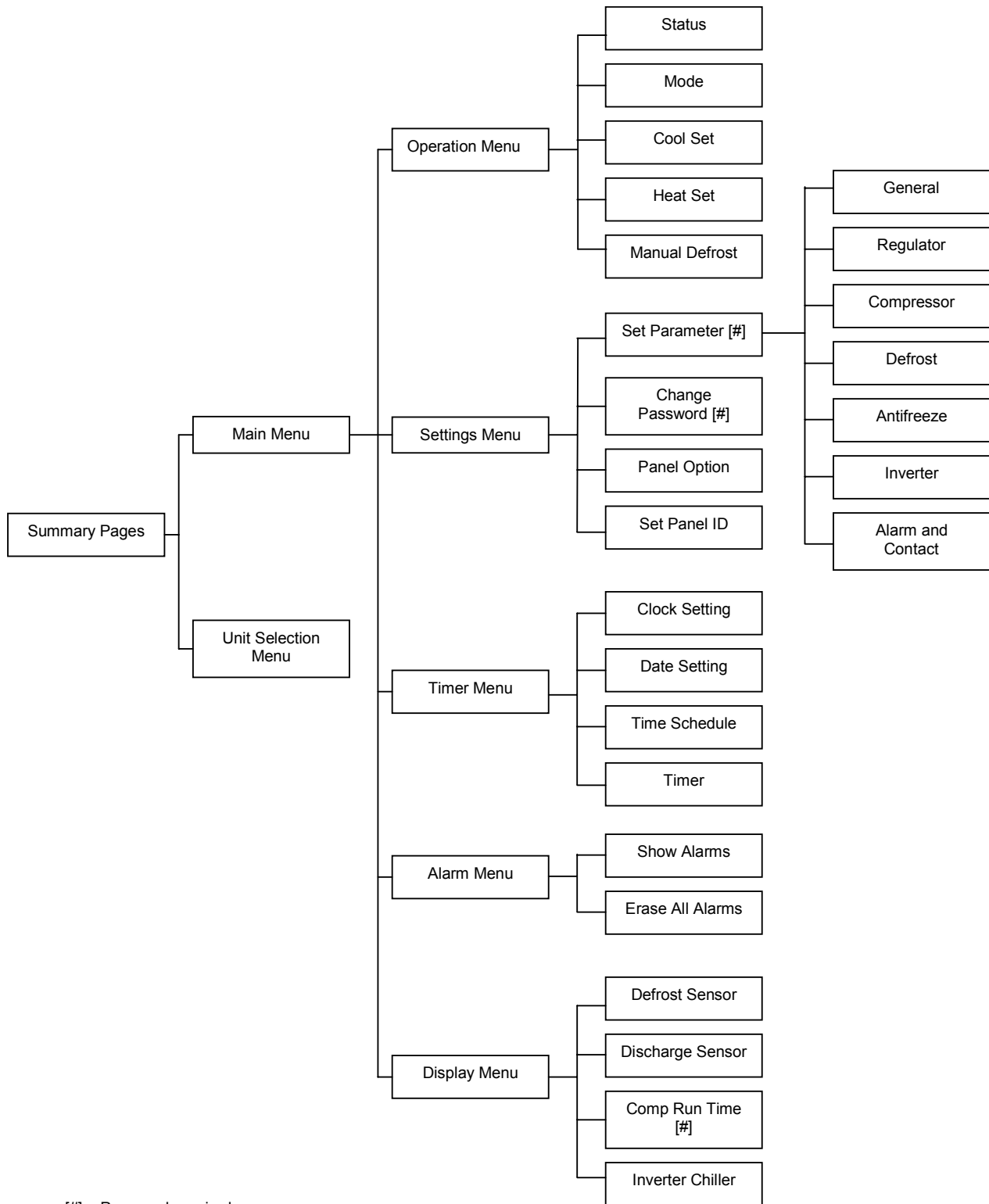
#### Status viewing:

- ON/OFF status
- Mode (Cooling / Heating/ Boiling)
- Mode set temperature
- Compressor status (ON/OFF/ DEFROST)
- Water in, Water Out, Outdoor air and Panel temperature
- Chiller model (Chiller, Heat Pump, Chiller/ Boiler, Chiller+Boiler, Heat Pump/Boiler, Heat Pump+Boiler)
- Advance parameter settings
- Defrost sensor temperatures
- Compressor discharge sensor temperatures
- Compressor run times
- Incoming alarm/ fault/ error

#### Status settings:

- ON/OFF switching
- Mode setting (Cooling / Heating/ Boiling)
- Mode set temperature
- Manual entering defrost
- Advance parameter settings
- Password changing
- Panel option setting (Backlight, Alarm Buzzer, Screen saver, Contrast, Brightness, temperature unit)
- Time and date settings
- Clearing compressor run time

## 5.2 Menu Structures



[#] – Password required

## 5.3 Chiller Menu Structure

### 5.3.1 Summary Pages

There are 4 pages in **[Summary Pages]**. Press **UP** or **DOWN** for page scrolling. Press **ENTER** to go to **[Main Menu]**. Time and date are shown on top of each page. Beside that, the bottom of each page shows current control unit of the Chiller.

For example: [00] - Chiller Panel controls Chiller ID 0 currently  
[03] - Chiller Panel controls Chiller ID 3 currently  
[All] - Chiller Panel controls all Chiller currently

1st page: Display ON/OFF status, Mode settings and Temperature settings.

|                  |           |
|------------------|-----------|
| 01/01/2000       | 12:00am   |
| <b>Status</b>    | : ON      |
| <b>Mode</b>      | : Cooling |
| <b>Cool Temp</b> | : 12.0°C  |
| [00]             |           |

2nd page: Display Compressor status.

|                   |         |
|-------------------|---------|
| 01/01/2000        | 12:00am |
| <b>Compressor</b> | : ON    |
| [00]              |         |

3rd page: Display Water In, Water Out, Outdoor air and Panel temperature

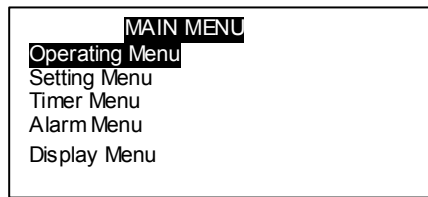
|                    |          |
|--------------------|----------|
| 01/01/2000         | 12:00am  |
| <b>Water In</b>    | : 19.8°C |
| <b>Water Out</b>   | : 25.6°C |
| <b>Outdoor Air</b> | : 32.2°C |
| <b>Panel</b>       | : 20.5°C |
| [00]               |          |

4th page: Display Chiller model, Compressor No. and Chiller ID.

|                 |           |
|-----------------|-----------|
| 01/01/2000      | 12:00am   |
| <b>Model</b>    | : Chiller |
| <b>No. Comp</b> | : 1 Comp  |
| <b>Unit No</b>  | : 0       |

### 5.3.2 Main Menu

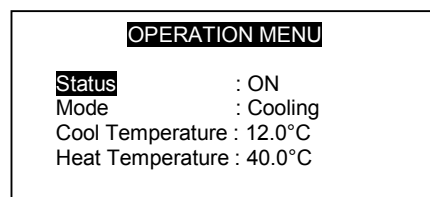
Press **ENTER** in [**Summary Pages**] to go into this menu



There are 5 sub menus in [**Main Menu**]. Press **UP** or **DOWN** to select sub menus, **ENTER** to enter into the sub menu or press **ESC** to exit to [**Summary Pages**]

#### 5.3.2.1 OPERATION MENU

Select [Operation Menu] in [Main Menu] and press **ENTER** to go into this menu.



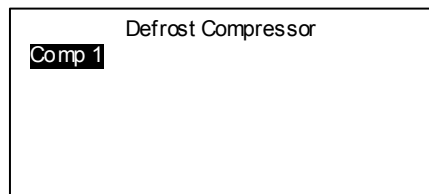
Some normal settings can be found here. Press **UP** or **DOWN** to select each settings, **ENTER** to start the setting or press **ESC** here to exit to [**Main Menu**]

Settings : -ON/OFF unit

- Mode changing (Cooling/ Heating/ Boiling)
- Cooling temperature setting
- Manual Defrost Selection

##### 5.3.2.1.1 Manual Defrost

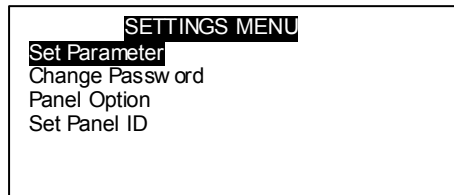
Select [**Manual Defrost**] in [**Operation Menu**] and press **ENTER** to go into this menu.



This menu lets user select one compressor to enter into defrost cycle manually, as long as the environment fulfill the defrost requirement.

### 5.3.2.2 Settings Menu

Select **[Settings Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

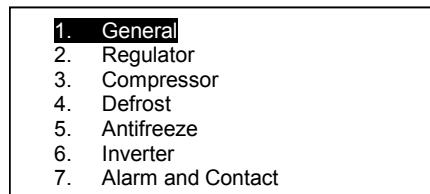


Some advance settings can be found here. Press **UP** or **DOWN** to select settings, **ENTER** to start the setting or press **ESC** here to exit to **[Main Menu]**.

- Settings
- Set Parameter
  - Password Changing
  - Panel Option
  - Set Panel ID

#### 5.3.2.2.1 Set Parameter

Select **[Set Parameter]** in **[Settings Menu]** and press **ENTER** to go into this menu.

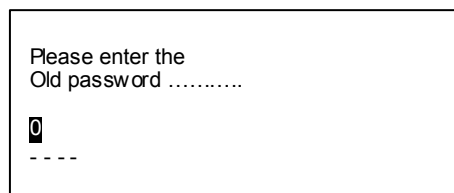


There are 7 groups of advance parameters for user to set in this menu, Press **UP** or **DOWN** to select the group, **ENTER** to go into the group or **ESC** to exit to **[Setting Menu]**.

- Settings:
- General
  - Regulator
  - Compressor
  - Defrost
  - Antifreeze
  - Inverter
  - Alarm and Contact

#### 5.3.2.2.2 Password Changing

Select **[Password Changing]** in **[Setting Menu]** and Press **ENTER** to go into this menu.



User can change the old password in this menu.  
Press **ESC** to exit to **[Settings Menu]**.

#### 5.3.2.2.3 Panel Option

Select **[Panel Option]** in **[Setting Menu]** and Press **ENTER** to go into this menu.

|                     |           |
|---------------------|-----------|
| <b>Backlight</b>    | : Normal  |
| <b>Buzzer</b>       | : On      |
| <b>Screen Saver</b> | : Disable |
| <b>Timeout</b>      | : 5m      |
| <b>Contrast</b>     | : 50%     |
| <b>Brightness</b>   | : Medium  |
| <b>Temp Unit</b>    | : °C      |

User can do some miscellaneous for the panel. These settings would not affect whole system performance.

Settings - Toggle Backlight

- Alarm Buzzer
- Enable / Disable Screen Saver
- Screen Saver timeout
- Contrast display
- Backlight brightness
- Temperature unit

Press **ESC** to exit to **[Settings Menu]**

#### 5.3.2.2.4 Set Panel ID

Select **[Set Panel ID]** in **[Settings Menu]** and press **ENTER** to go into this menu.

|                                   |
|-----------------------------------|
| Please enter the<br>Panel ID..... |
| => Unit 0                         |

User can assign the ID no, to the panel.

*Example:* If ID no. 0 has been assigned, the panel acts like Master Panel Unit. It can choose to control each Chiller in the network.

If other ID no. (1-50) has been assigned, the panel acts like Slave Panel Unit. It is dedicated to one particular Chiller. It can only control the Chiller with same ID in the network.

Press **[ESC]** to exit to **[Settings Menu]**

### 5.3.2.3 Timer Menu

Select **[Timer Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

|                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------|
| <b>TIMER MENU</b><br><br><b>Clock Setting</b><br><b>Date Setting</b><br><b>Time Schedule</b><br><b>Timer : Disable</b> |
|------------------------------------------------------------------------------------------------------------------------|

All the timer/ schedule settings are included in this menu. Press **UP** or **DOWN** to select each settings. **ENTER** to start the setting or press **ESC** here to exit to **[Main Menu]**.

Settings:

- Set Clock
- Set Date
- Set Schedule ( 7 days Programmable Timer)
- Enable/ Disable Timer Schedule

#### 5.3.2.3.1 Set Clock

Select **[Clock Setting]** in **[Timer Menu]** and press **ENTER** to go into this menu.

|                                                 |
|-------------------------------------------------|
| <b>Set Time :</b><br><br>hh:mm<br><b>00: 00</b> |
|-------------------------------------------------|

User can set the time in this menu. The time setting is in 24-hour format.

Pres **[ESC]** to exit to **[Timer Menu]**.

#### 5.3.2.3.2 Set Date

Select **[Date Setting]** in **[Timer Menu]** and press **ENTER** to go into this menu.

|                       |
|-----------------------|
| <b>Set Date :</b>     |
| yyyy mm dd            |
| <b>2000</b> / 01 / 01 |

User can set the date in this menu. The date is set according to sequence below:

(year) / (month) / (day)

Press **[ESC]** to exit to **[Timer Menu]**.

#### 5.3.2.3.3 Set Schedule

Select **[Schedule Timer]** in **[Timer Menu]** and press **ENTER** to go into this menu.

|            | <b>Timer 1</b> |            | <b>Timer 2</b> |            |
|------------|----------------|------------|----------------|------------|
|            | <b>ON</b>      | <b>OFF</b> | <b>ON</b>      | <b>OFF</b> |
| <b>Sun</b> | 0800           | 1600       | -----          | -----      |
| <b>Mon</b> | 0800           | 1600       | -----          | -----      |
| <b>Tue</b> | 0800           | 1600       | -----          | -----      |
| <b>Wed</b> | 0800           | 1600       | -----          | -----      |

This is the 7 days programmable timer schedule menu. There are 2 ON/OFF events in one day. User can choose to set each day of week (Sunday - Saturday) ON/OFF timer. Before this schedule carry their effect to the Chiller, user need to set the **[Timer]** in **[Timer Menu]** to enable.

Press **[ESC]** to exit to **[Timer Menu]**.

#### 5.3.2.4 Alarm Menu

Select **[Alarm Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

|                        |
|------------------------|
| <b>ALARM MENU</b>      |
| <b>Show Alarms</b>     |
| <b>Erase All Alarm</b> |

This place keeps records for all previous occurred fault/ alarms. User can view the alarm history and clear that record (alarm history) as well. The panel can keep up to 20 fault/ alarm records.

Press **ESC** to exit to **[Main Menu]**

#### 5.3.2.4.1 Show Alarms

Select **[Show Alarms]** in **[Alarm Menu]** and press **ENTER** to go into this menu.

|                        |         |
|------------------------|---------|
| <b>Alarm 1</b>         | [Ch 0]  |
| <b>Comp 1 overload</b> |         |
| 01/ 01/ 00             | 12:00am |

User can view all the fault/ alarm records in this menu.

The record shows

- Alarm type
- Alarm occurred date
- Alarm occurred time
- Alarm occurred unit (Chiller ID)

Beside that, user can erase the alarm record in this menu.

Press **[ESC]** to exit to **[Alarm Menu]**.

#### 5.3.2.4.2 Erase All Alarms

Select **[Erase All Alarms]** in **[Alarm Menu]** and press **ENTER** to go into this menu.

|                                                                                             |
|---------------------------------------------------------------------------------------------|
| <p><b>Are you sure ?</b></p> <p><b>Press Enter to erase,</b><br/><b>or ESC to exit.</b></p> |
|---------------------------------------------------------------------------------------------|

User can erase all the alarm / fault records at once in this menu.

Press **[ESC]** to exit to **[Alarm Menu]**.

#### 5.3.2.5 Display Menu

Select **[Display Menu]** in **[Main Menu]** and press **ENTER** to go into this menu.

|                       |
|-----------------------|
| <b>DISPLAY MENU</b>   |
| <b>Defrost Sensor</b> |
| Discharge Sensor      |
| Comp Run Time         |
| Inverter Chiller      |

This menu display Defrost Sensor temperature, Compressor Discharge sensor temperature, Compressor Run Time and Inverter Chiller. Beside that, user can clear each Compressor Run Time for Chiller.

Press **[ESC]** to exit to **[Main Menu]**

#### 5.3.2.5.1 Defrost Sensor

Select **[Defrost Sensor]** in **[Display Menu]** and press **ENTER** to go into this menu.

|                                                            |
|------------------------------------------------------------|
| <p><b>Defrost Sensor</b></p> <p><b>Comp 1 : 12.8°C</b></p> |
|------------------------------------------------------------|

User can view the defrost sensor temperature for each compressor in the Chiller.

Press **[ESC]** to exit to **[Display Menu]**

#### 5.3.2.5.2 Discharge Sensor

Select **[Discharge Sensor]** in **[Display Menu]** and press **ENTER** to go into this menu.

|                                                              |
|--------------------------------------------------------------|
| <p><b>Discharge Sensor</b></p> <p><b>Comp 1 : 36.5°C</b></p> |
|--------------------------------------------------------------|

User can view the discharge sensor temperature for each compressor in the Chiller.

Press **[ESC]** to exit to **[Display Menu]**.

#### 5.3.2.5.3 Comp Run Time

Select **[Comp Run Time]** in **[Display Menu]** and press **ENTER** to go into this menu.

|                                                           |
|-----------------------------------------------------------|
| <p><b>Comp Run Time</b></p> <p><b>Comp 1 : 13579h</b></p> |
|-----------------------------------------------------------|

User can view the compressor run time for each compressor in the Chiller. Beside that, user can clear each compressor run time in this menu. User needs to key in the correct password before clearing the compressor run time.

Press **[ESC]** to exit to **[Display Menu]**.

#### 5.3.2.5.4 Inverter Chiller

Select **[Inverter Chiller]** in **[Display Menu]** and press **ENTER** to go into this menu.

|                                                                                                                                                      |                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Inverter Chiller</b></p> <p><b>Comp. Freq : 100Hz</b></p> <p><b>Exv. : 180</b></p> <p><b>Comp. Amp : 11.0A</b></p> <p><b>DC Bus : 516V</b></p> | <p><b>Suction : 13.3°C</b></p> <p><b>BPHE in : 6.0°C</b></p> <p><b>BPHE out : 12.9°C</b></p> <p><b>Condenser : 43.0°C</b></p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|

This menu display compressor frequency, EXV opening, DC voltage, Current, Suction Sensor, BPHE in sensor, BPHE out sensor and condenser in sensor.

Press **[ESC]** to exit to **[Display Menu]**.

## 6. OPERATION USER MANUAL

### 6.1 Starting

Chiller panel can be set as Master or Slave panel unit. When the Panel ID is set to '0', it acts like a Master panel, whereas it is Slave panel if Panel ID is set to others number (1-50).

Chiller panel can control the Chiller if both ID no. (Panel ID and Chiller ID) are same.

For example: Panel ID 1 can only control Chiller ID 1

Master Panel can choose to control each Chiller or control all Chiller at once in the network.

For example : Panel ID 0 (master) can control Chiller ID 0 / ID 1/ ID 32 .... or all Chillers at once.

Panel ID can be set in **Set Panel ID** in **Settings Menu**.

Please enter the  
Panel ID .....

=> Unit 0

## 6.2 CHILLER OPERATION CONTROL

### 6.2.1 STARTING

During power on for the Chiller Panel, it needs to take several times to collect information from the Chiller. At this time, all the status will show "--". Please ensure the particular Chiller exists in the network. When the process is completed, user can start to control the Chiller using the panel.

|            |         |
|------------|---------|
| 01/01/2000 | 12:00am |
| Status     | : --    |
| Mode       | : --    |
| Cool Temp  | : --    |
| [00]       |         |

*In gathering information process*

|            |           |
|------------|-----------|
| 01/01/2000 | 12:00am   |
| Status     | : ON      |
| Mode       | : Cooling |
| Cool Temp  | : 12°C    |
| [00]       |           |

*Gathering information completed*

### 6.2.2 CHANGING DISPLAY UNIT

Chiller Panel (Master) can choose to choose to control / display each Chiller status. This can be done in [Summary Pages] only.

|            |           |
|------------|-----------|
| 01/01/2000 | 12:00am   |
| Status     | : ON      |
| Mode       | : Cooling |
| Cool Temp  | : 12      |

*In [Summary Pages], press and hold **ENTER** button (1 second) to go into [Unit Selection] menu.*

|                |     |
|----------------|-----|
| Unit Selection | :   |
| Select All     |     |
| Select One     | : 0 |

*Select "**Select All**" and press **ENTER** if user want to control all Chiller in the network, or select "**Select One**" to control a particular Chiller. Press **ESC** to exit to [Summary Pages].*

|                |     |
|----------------|-----|
| Unit Selection | :   |
| Select All     |     |
| Select One     | : 0 |

*Select a Chiller ID via **UP** or **DOWN** and press **ENTER** to confirm or **ESC** to cancel.*

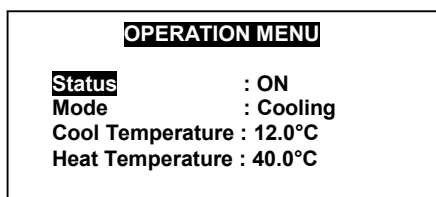
### 6.2.3 Switching On/Off

There are several ways to switch ON/OFF for the Chiller.

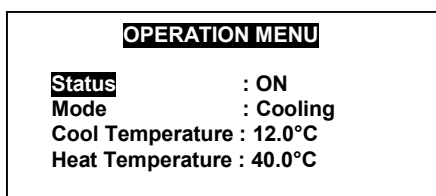
#### i) [Summary Pages]

Press and hold **ON/OFF** button (hold 1 second). Please note that the **ON/OFF** button will only function in [Summary Pages].

#### ii) [Operation Menu]



*In [Operation Menu], select “Status” and press ENTER.*



*Toggle ON/OFF via UP or DOWN button, and then press ENTER to confirm the change or ESC to cancel.*

#### iii) [Timer Menu]



7 days programmable time can turn chiller ON/OFF. User can set the schedule in this [Timer Menu]. Please refer **6.2.11 (page 40)** for schedule settings.

## 6.2.4 Switching Mode

There are several ways to switch the mode for the Chiller. Please take note that some mode cannot be set due to current Chiller model settings.

| Chiller Model      | Mode    |         |         |
|--------------------|---------|---------|---------|
|                    | Cooling | Heating | Boiling |
| Chiller            | √       | x       | x       |
| Heat Pump          | √       | √       | x       |
| Chiller / Boiler   | √       | x       | √       |
| Heat Pump / Boiler | √       | √       | √       |
| Chiller + Boiler   | √       | x       | Auto    |
| Heat Pump + Boiler | √       | √       | Auto    |

√ - Allow to set  
x - Not Allow to set  
Auto - Turn ON automatically

### i) [Summary Pages]

Cooling - Press and hold **COOL** button.

Heating - Press and hold **HEAT** button (if it allows to set).

Boiling - Press and hold **HEAT** button again (if it allows to set).

### ii) [Operation Menu]



| OPERATION MENU   |           |
|------------------|-----------|
| Status           | : ON      |
| Mode             | : Cooling |
| Cool Temperature | : 12.0°C  |
| Heat Temperature | : 40.0°C  |

*In [Operation Menu], select “Mode” and press **ENTER** to start setting or **ESC** to exit to [Main Menu]*

| OPERATION MENU   |                  |
|------------------|------------------|
| Status           | : ON             |
| Mode             | : <b>Cooling</b> |
| Cool Temperature | : 12.0°C         |
| Heat Temperature | : 40.0°C         |

*Toggle **ON/OFF** via **UP** or **DOWN** button, and then press **ENTER** to confirm the change or **ESC** to cancel.*

## 6.2.5 Changing Mode Set Temperature

There are 2 ways to change the mode set temperature for the Chiller.

### i) [Operation Menu]

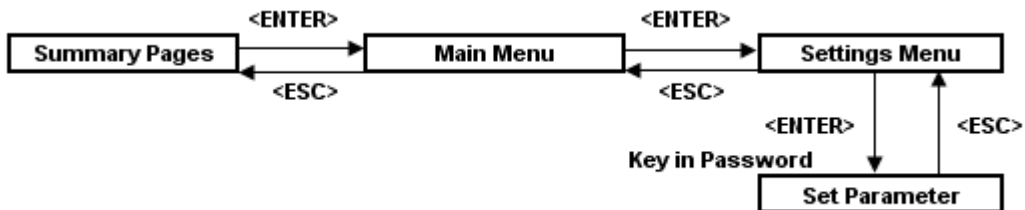


| OPERATION MENU   |           |
|------------------|-----------|
| Status           | : ON      |
| Mode             | : Cooling |
| Cool Temperature | : 12.0° C |
| Heat Temperature | : 40.0° C |

In [Operation Menu], select “Cool Temp” / “Heat Temp” and press **ENTER** start setting or **ESC** to exit to [Main Menu].

| OPERATION MENU   |                  |
|------------------|------------------|
| Status           | : ON             |
| Mode             | : Cooling        |
| Cool Temperature | : <b>12.0° C</b> |
| Heat Temperature | : 40.0° C        |

Change value via **UP** or **DOWN** button, and then press **ENTER** to confirm the change or **ESC** to cancel.



|                      |
|----------------------|
| 1. General           |
| <b>2. Regulator</b>  |
| 3. Compressor        |
| 4. Defrost           |
| 5. Antifreeze        |
| 6. Inverter          |
| 7. Alarm and Contact |

In [Set Parameter], select “Regulator” and press **ENTER**. Press **ESC** to exit to [Main Menu].

|                   |          |
|-------------------|----------|
| <b>R1 Cool SP</b> | : 12.0°C |
| R2 Cool Diff      | : 3.0°C  |
| R3 Heat SP        | : 40.0°C |
| R4 Heat Diff      | : 3.0°C  |
| R5 Min Cool SP    | : -20°C  |
| R6 Max Cool SP    | : 40°C   |
| R7 Min Heat SP    | : -20°C  |

Select “R3”/ “R5” and press **ENTER** to start setting or **ESC** to exit to [Set Parameter] menu.

|                |                 |
|----------------|-----------------|
| R1 Cool SP     | : <b>12.0°C</b> |
| R2 Cool Diff   | : 3.0°C         |
| R3 Heat SP     | : 40.0°C        |
| R4 Heat Diff   | : 3.0°C         |
| R5 Min Cool SP | : -20°C         |
| R6 Max Cool SP | : 40°C          |
| R7 Min Heat SP | : -20°C         |

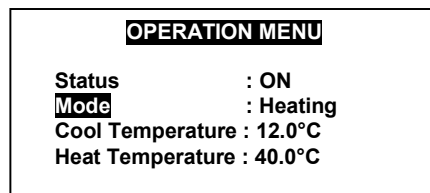
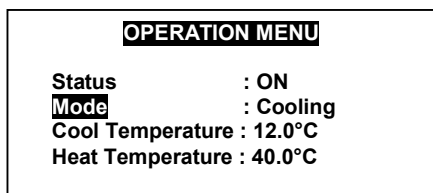
Change value via **UP** or **DOWN** button. The boarderline is limited by **R5&R6** (cool), **R7&R8**(heat). Press **ENTER** to confirm or **ESC** to cancel.

### 6.2.6 Manual Defrost

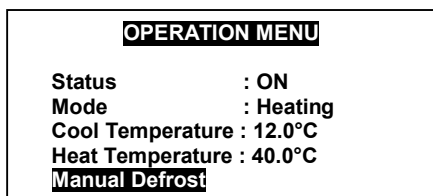
User can choose which compressor will go into manual defrost cycle by using the Chiller Panel, as long as the condition is fulfilled with defrost condition. This can be done in **[Operation Menu]**.



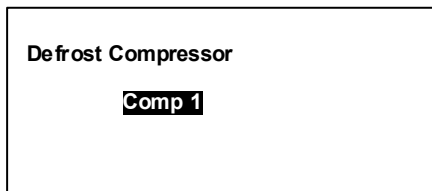
Please take note that “**Manual Defrost**” option will only available in HEATING mode. It will disappear in COOLING/ BOILING mode.



*“Manual Defrost” disappear when Chiller not in HEATING mode*



*In **[Operation Menu]**, select **[Manual Defrost]**, press **ENTER** to go into it, or **ESC** to exit to **[Main Menu]**.*

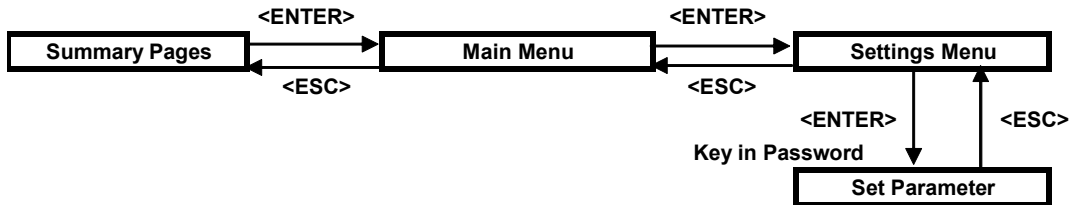


*Select which compressor to go into defrost cycle via **UP** or **DOWN** button. Press **ENTER** to confirm or **ESC** to exit to **[Operation Menu]**.*

### 6.2.7 Advance Parameter Settings

The Chiller Panel provide user a lot of advance parameter settings for the Chiller. The parameters are divided into 7 groups. There all are stored in **[Set Parameter]** menu and it is password-protected layer in the panel.

**\* CAUTION : INPROPER SETTINGS WILL CAUSE PERMANENT DAMAGE TO THE CHILLER !!!**



7 groups of Advance Parameter:

#### 1) General

|                        |            |
|------------------------|------------|
| <b>G1 Mode</b>         | : Chiller  |
| <b>G2 No. Comp</b>     | : 1 Comp   |
| <b>G3 On/Off in</b>    | : Disable  |
| <b>G4 Cool/Heat in</b> | : Disable  |
| <b>G5 Ext Alarm in</b> | : Disable  |
| <b>G6 Water sys</b>    | : Isolated |
| <b>G7 Unit No</b>      | : 0        |

#### 2) Regulator

|                       |          |
|-----------------------|----------|
| <b>R1 Cool SP</b>     | : 12.0°C |
| <b>R2 Cool Diff</b>   | : 3.0°C  |
| <b>R3 Heat SP</b>     | : 40.0°C |
| <b>R4 Heat Diff</b>   | : 3.0°C  |
| <b>R5 Min Cool SP</b> | : -20°C  |
| <b>R6 Max Cool SP</b> | : 40°C   |
| <b>R7 Min Heat SP</b> | : -20°C  |

|                         |         |
|-------------------------|---------|
| <b>R8 Max Heat SP</b>   | : 90°C  |
| <b>R9 Ax Heat SP</b>    | : 5.0°C |
| <b>R10 Ax Heat Diff</b> | : 2.0°C |
| <b>R11 Au Bo SP</b>     | : 5.0°C |
| <b>R12 Au Bo Diff</b>   | : 2.0°C |
| <b>R13 Au Bo Start</b>  | : 30m   |

### 3) Compressor

|                        |         |
|------------------------|---------|
| <b>C1 Min Run</b>      | : 12s   |
| <b>C2 Min Stop</b>     | : 240s  |
| <b>C3 2On Interval</b> | : 360s  |
| <b>C4 2Cp ON Dly</b>   | : 15s   |
| <b>C5 P-Cp ON Dly</b>  | : 60s   |
| <b>C6 Cp-P OFF Dly</b> | : 40°C  |
| <b>C7 Cp Cut Off</b>   | : 120°C |

### 4) Condenser Defrost

|                       |        |
|-----------------------|--------|
| <b>D1 Start Temp</b>  | : -3°C |
| <b>D2 End Temp</b>    | : 14°C |
| <b>D3 Max Dura</b>    | : 10m  |
| <b>D4 Interval</b>    | : 45m  |
| <b>D5 Dly Bfr Def</b> | : 0s   |
| <b>D6 Dly Aft Def</b> | : 0s   |

### 5) Cool Mode Antifreeze

|                       |         |
|-----------------------|---------|
| <b>A1 Heater SP</b>   | : 5°C   |
| <b>A2 Heater Diff</b> | : 2.0°C |
| <b>A3 Sensor</b>      | : Leave |
| <b>A4 Alarm SP</b>    | : 3°C   |
| <b>A5 Alarm Diff</b>  | : 2.0°C |

### 6) Inverter

|                      |           |
|----------------------|-----------|
| <b>V1 Cp Freq</b>    | : 100Hz   |
| <b>V2 EXV</b>        | : 180     |
| <b>V3 Cp Manual</b>  | : Disable |
| <b>V4 EXV Manual</b> | : Disable |
| <b>V5 Def Mode</b>   | : Disable |

### 7) Alarm and Contact

|                      |          |
|----------------------|----------|
| <b>P1 FS Confirm</b> | : 5s     |
| <b>P2 FS Delay</b>   | : 180s   |
| <b>P3 LP Delay</b>   | : 30s    |
| <b>P4 CO Reset</b>   | : Manual |
| <b>P5 HP Reset</b>   | : Auto   |
| <b>P6 LP Reset</b>   | : Auto   |
| <b>P7 FO Reset</b>   | : Manual |

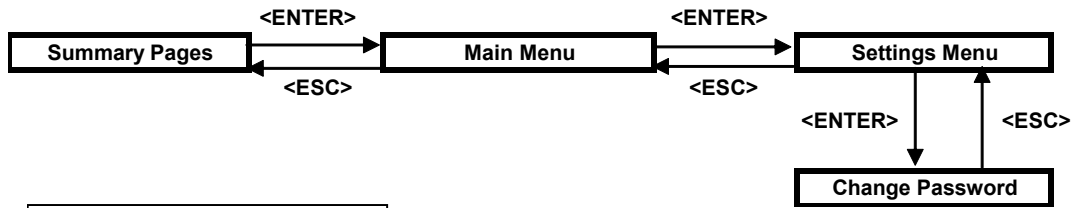
|                       |          |
|-----------------------|----------|
| <b>P8 RO Reset</b>    | : Manual |
| <b>P9 FS Reset</b>    | : Manual |
| <b>P10 Aux Reset</b>  | : Manual |
| <b>P11 A/F Reset</b>  | : Manual |
| <b>P12 CO Contact</b> | : Normal |
| <b>P13 HP Contact</b> | : Normal |
| <b>P14 LP Contact</b> | : Normal |

|                       |          |
|-----------------------|----------|
| <b>P15 FO Contact</b> | : Normal |
| <b>P16 PO Contact</b> | : Normal |
| <b>P17 FS Contact</b> | : Normal |
| <b>P18 EA Contact</b> | : Normal |
| <b>P19 DE Contact</b> | : Normal |

Please refer to **8. APPENDIX** for detail description.

## 6.2.8 Changing Password

For security purpose, some places in the panel are password-protected. User can change the password at anytime.



Please enter the  
Old password .....

0  
----

User needs to enter the old password in order to change the password.

Change the 1st digit value via **UP** or **DOWN**. Press **ENTER** to start enter 2nd digit and the rest, or **ESC** to exit at anytime.

Password accepted . . .  
Access granted !

Password error . . .  
Access denied !

If password correct, this message will be shown and proceed to new password settings.

If password not correct, this message will be shown and exit to **[Settings Menu]**

Please enter the  
New password .....

0  
----

Same as previous, **UP DOWN** to change value, **ENTER** to go to next digit, **ESC** to exit.

User is not allowed to set the password to 0000.

New password  
Has been set .....

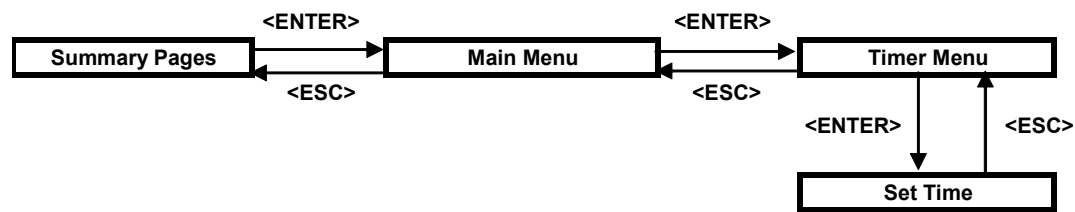
If new password is accepted, this message will be shown and then exit to **[Settings Menu]**.

New password  
'0 0 0 0'  
Is not accepted .....

If new password is '0000', this message will be shown and then exit to **[Settings Menu]**. The password remains as previous.

6.2.9 Clock Setting

User can set the clock for the panel.



Set Time :

hh mm

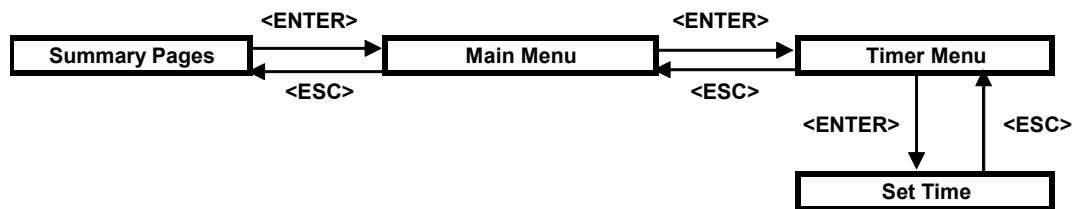
00 : 00

*UP or DOWN to change 'hour'. ENTER to set 'minute' or ESC to exit to [Timer Menu].*

*UP or DOWN to change 'minute'. ENTER to confirm or ESC to set 'hour' again.*

6.2.10 DATE SETTING

User can set the date for the panel.



Set Time :

yyyy hh mm

2000 / 01 / 01

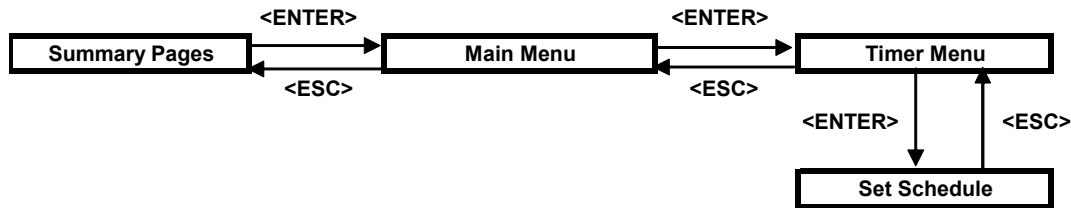
*UP or DOWN to change 'year'. ENTER to set 'month' or ESC to exit to [Timer Menu].*

*UP or DOWN to change 'month'. ENTER to set 'day' or ESC to set 'year' again.*

*UP or DOWN to change 'day'. ENTER to confirm or ESC to set 'month' again.*

6.2.11 7 Days Programmable Setting

The are 2 ON/OFF events in one day for the schedule. This schedule is applicable to all the chillers in the network.



|     | Timer 1 |      | Timer 2 |      |  |
|-----|---------|------|---------|------|--|
|     | ON      | OFF  | ON      | OFF  |  |
| Sun | 0800    | 1600 | ----    | ---- |  |
| Mon | 0800    | 1600 | ----    | ---- |  |
| Tue | 0800    | 1600 | ----    | ---- |  |
| Wed | 0800    | 1600 | ----    | ---- |  |

*UP or DOWN select day of week, ENTER to select event or ESC to exit to [Timer Menu].*

|     | Timer 1 |      | Timer 2 |      |  |
|-----|---------|------|---------|------|--|
|     | ON      | OFF  | ON      | OFF  |  |
| Sun | 0800    | 1600 | ----    | ---- |  |
| Mon | 0800    | 1600 | ----    | ---- |  |
| Tue | 0800    | 1600 | ----    | ---- |  |
| Wed | 0800    | 1600 | ----    | ---- |  |

*UP or DOWN select event. ENTER to start setting or ESC to back to select day of week.*

*Event setting is same like time setting. User can disable the event by set it to '- - -'*

Before the schedule will carry the effect, user need to set **ENABLE** for “**TIMER**” in [Timer Menu].

| TIMER MENU      |  |
|-----------------|--|
| Set Time        |  |
| Set Date        |  |
| Set Schedule    |  |
| Timer : Disable |  |

*Select “Timer” and press ENTER to start the settings. UP or DOWN to toggle Enable/ Disable, ENTER to confirm or ESC to cancel.*

## 6.2.12 Viewing Alarm / Erase Alarm Record

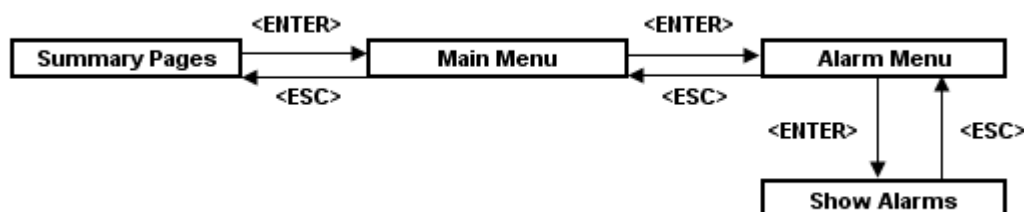
Whenever a new fault/ alarm is occurred, there will be a message pop up to show the fault/ alarm. Backlight will blinking with beeping sound (if “**Alarm Buzzer**” is set ON). If the fault/ alarm has not been dissolved from the Chiller, a sign **[A]** will be shown in the **[Summary Pages]**.(from pop up menu) automatically if the fault/ alarms have been dissolved.

While the fault/ alarms have not been dissolved (sign **[A]**), user can check that fault/ alarm by to into **[Alarm Menu]**. If all the fault/ alarm have been dissolved, user can view the fault/ alarm history records in **[Alarm Menu]** as well. Screen saver will be deactivated while all the alarms have not been dissolved.

If panel ID is set 0 (Master panel), it can receive and view all the fault / alarms from all chillers in the network.

|                 |              |
|-----------------|--------------|
| New Alarm 1     | [Ch 0]       |
| Comp 1 overload |              |
| 12:00am         | 01/ 01/ 2000 |

*[Ch 0] show alarm occurred unit.  
Press any button to stop backlight blinking and beeping.  
Press **ESC** again to exit to normal page.*



|                 |         |
|-----------------|---------|
| New Alarm 1     | [Ch 0]  |
| Comp 1 overload |         |
| 01 / 01/ 00     | 12:00am |

*Press **UP** or **DOWN** to scroll the record.  
Press **ENTER** if user want to erase the record, or **ESC** to exit to **[Alarm Menu]**.*

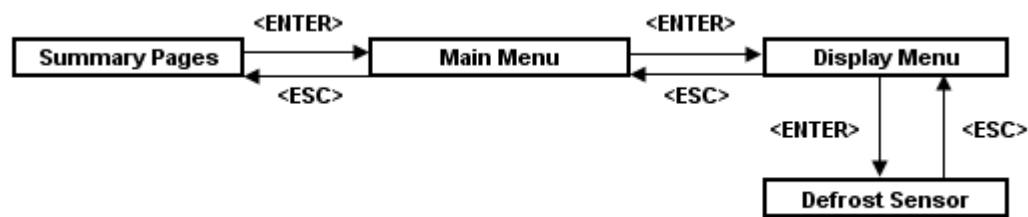
|                                          |
|------------------------------------------|
| Erase Alarm ?                            |
| Please Enter to Erase,<br>Or ESC to exit |

*Press **ENTER** to erase the alarm, or **ESC** to cancel.*

User can erase all the fault/ alarm record at once time through **[Erase All Alarm]** in **[Alarm Menu]**.

6.2.13 Viewing Defrost Sensor Temperature

The Chiller Panel displays defrost sensor temperature for each compressor in [Defrost Sensor] in [Display Menu].



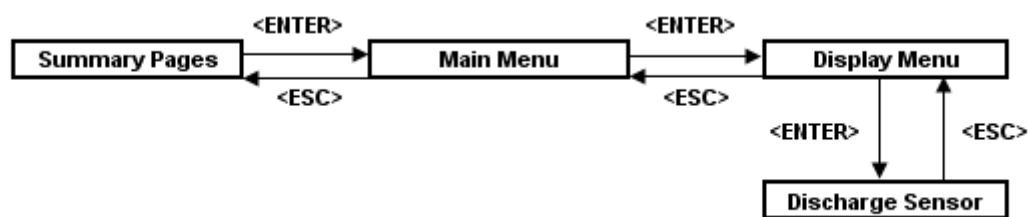
Defrost Sensor

Comp 1 : 12.8°C

Press **ESC** to exit to [Display Menu]

6.2.14 Viewing Compressor Discharge Temperature

The Chiller Panel displays compressor discharge temperature for each compressor in [Discharge Sensor] in [Display Menu].



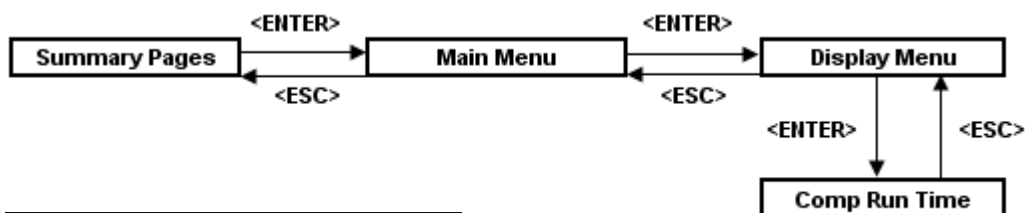
Discharge Sensor

Comp 1 : 36.5°C

Press **ESC** to exit to [Display Menu]

### 6.2.15 Viewing / Clear Compressor Run Time

User can view/ clear the compressor run time for the Chiller in **[Comp Run Time]** in **[Display Menu]**.



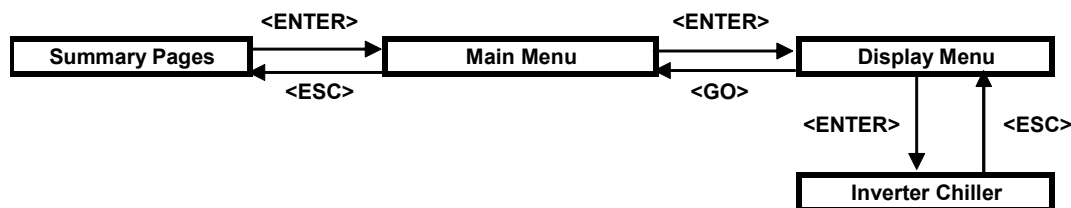
|                                         |
|-----------------------------------------|
| <b>Comp Run Time</b><br>Comp 1 : 13579h |
|-----------------------------------------|

Press **UP** or **DOWN** to select the compressor. **ENTER** to start clear the run time, or **ESC** to exit to **[Display Menu]**.

|                                                                    |
|--------------------------------------------------------------------|
| <b>Clear Run Time ?</b><br>Press Enter to Clear<br>Or ESC to exit. |
|--------------------------------------------------------------------|

Press **ENTER** and key in the password to confirm or **ESC** to cancel

### 6.2.16 Viewing Inverter Chiller



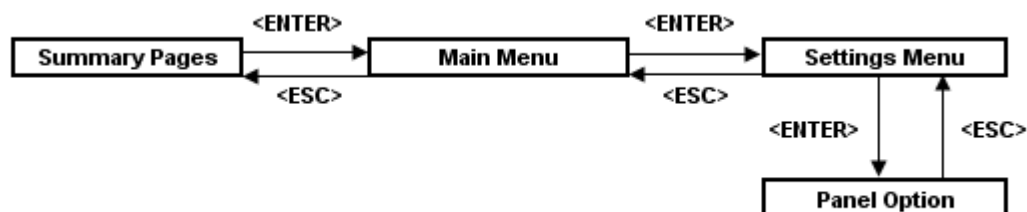
|                         |         |
|-------------------------|---------|
| <b>Inverter Chiller</b> |         |
| Comp. Freq              | : 100Hz |
| Exv.                    | : 180   |
| Comp. Amp               | : 11.0A |
| DC Bus                  | : 516V  |

|           |          |
|-----------|----------|
| Suction   | : 13.3°C |
| BPHE in   | : 6.0°C  |
| BPHE out  | : 12.9°C |
| Condenser | : 43.0°C |

Press **ESC** to exit to **[Display Menu]**

### 6.2.17 Miscellaneous Settings

User can do some miscellaneous settings to the panel.



|                  |           |
|------------------|-----------|
| <b>Backlight</b> | : Normal  |
| Buzzer           | : On      |
| Screen Saver     | : Disable |
| Timeout          | : 5m      |
| Contrast         | : 50%     |
| Brightness       | : Medium  |
| Temp Unit        | : ° C     |

Press **UP** or **DOWN** to select the item. **ENTER** to set, or **ESC** to exit to **[Settings Menu]**.

Press **UP** or **DOWN** to toggle the value. **ENTER** to confirm, or **ESC** to cancel.

| Parameter     | Value             | Description                                      |
|---------------|-------------------|--------------------------------------------------|
| Backlight     | Normal            | Turn ON backlight for 30s via key press          |
|               | Always            | Always ON backlight                              |
| Buzzer        | ON                | Enable beeping sound when fault/ alarm occurred  |
|               | OFF               | Disable beeping sound when fault/ alarm occurred |
| *Screen Saver | Enable            | Show screen saver when timeout                   |
|               | Disable           | No screen save                                   |
| *Timeout      | 1-30m             | Timeout for showing screen saver                 |
| Contrast      | 0-100%            | Adjust the contrast setting for the LCD panel    |
| Brightness    | OFF               | No backlight                                     |
|               | Low, Medium, High | Adjust the backlight intensity                   |
| Temp Unit     | °C                | Display temperature in degree Celsius            |
|               | °F                | Display temperature in degree Fahrenheit         |

\* This product must be branded. Screen saver will be deactivated for brand less panel

### 6.3 CMOS Reset

- CMOS reset allows user to reset some settings to default value such as:

Password       -> 0001  
 Backlight       -> Normal  
 Buzzer           -> ON  
 Screen Saver   -> Disable  
 Timeout          -> 5m  
 Contrast        -> 50%  
 Brightness      -> Medium  
 Temp Unit       -> °C

- Procedures

1. Power OFF the panel
2. Close the jumper JH2 with the provided jumper header
3. Power ON the panel and the LCD panel should display as follow:

CMOS is resetting .....

**CMOS reset completed !**  
  
**Please remove JUMPER**  
**and restart the panel**

4. Remove the jumper header (put the jumper header on 1 pin only), power OFF and then power ON the panel.

## 7. PROBLEM AND TROUBLESHOOTING

|    | Symptoms                                              | Possible Cause                                                                                                                                                             | Troubleshooting                                                                                                                                                                                                                                                                      |
|----|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Panel gets hot abnormally                             | - Wiring fault in 12VDC supply                                                                                                                                             | - Change a new panel module and turn ON the unit again after the verification                                                                                                                                                                                                        |
| 2  | The LCD no display (blank screen)                     | - Wiring fault in 12VDC supply<br>- No power supply<br>- Voltage supply too low<br>- Module defective                                                                      | - Correct the wiring problem<br>- Check the wiring and supply 12VDC to panel<br>- Check the power source<br>- Change a new panel module                                                                                                                                              |
| 3  | - '-' for all status (quite a long time)              | - Panel cannot/ not yet received the information from chiller or FCU completely<br><br>- That particular unit address is not recognized by the panel<br>- Module defective | - Ensure the selected unit exists in the network<br>- Ensure the wiring is correct<br>- Ensure the wiring is not defective<br>- Ensure the wiring has been isolated from high power cable<br>- Select a coherent unit address on the panel (refer to 6.2.2)<br>- Change a new module |
| 4  | ON/ OFF, COOL or HEAT button not function             | - Software limitation<br>- Module defective                                                                                                                                | - Ensure it is pressed (hold 1s) in [Summary Pages] not in other menu.<br>- Change a new module                                                                                                                                                                                      |
| 5  | Cannot switch to HEATING mode                         | - Software limitation                                                                                                                                                      | - Ensure this mode is available in current "Model" of Chiller, please refer to 6.2.4                                                                                                                                                                                                 |
| 6  | Cannot switch to BOILING mode                         | - Software limitation                                                                                                                                                      | - Ensure this mode is available in current "Model" of Chiller, please refer to 6.2.4                                                                                                                                                                                                 |
| 7  | No "Manual Defrost" item                              | - Software limitation                                                                                                                                                      | - Ensure current running mode is HEATING                                                                                                                                                                                                                                             |
| 8  | Cannot step inside [Set Parameter]                    | - Software limitation. Panel has not received all the information from chiller completely                                                                                  | - Refer to symptoms 3                                                                                                                                                                                                                                                                |
| 9  | 7 Days Programmable Timer not function                | - Software limitation. User did not activate the schedule                                                                                                                  | Control of Chiller:<br>- Ensure the "Timer" in [Timer Menu] is set ENABLE<br>Control of Chiller:<br>- Ensure the "Timer" in [Operation Menu] is set ENABLE                                                                                                                           |
| 10 | No beeping sound when new alarm occurred              | - Software limitation. User did not set ON to the alarm buzzer                                                                                                             | - Ensure "Buzzer" in [Panel Option] is set ON                                                                                                                                                                                                                                        |
| 11 | No screen saver after timeout                         | - Software limitation. User did not set ENABLE to the screen saver                                                                                                         | - Ensure "Screen Saver" in [Panel Option] is set ENABLE                                                                                                                                                                                                                              |
| 12 | Time always reset to 12:00am, 1st Jan 2000            | - No backup battery<br>- Energy of the backup battery is low                                                                                                               | - Replace coin cell battery                                                                                                                                                                                                                                                          |
| 13 | Panel stop operation. Whole operation freezing (hang) | - Unstable power supply<br>- Energy of the backup battery is low                                                                                                           | - Power off the panel. Take out the backup battery as well. Replace with a new 3V coin cell battery if necessary. Put back the backup battery into the panel and power on again                                                                                                      |

## 8. APPENDIX

|    | General                                                                                                                 | Unit | Default               | Min | Max | Resolution |
|----|-------------------------------------------------------------------------------------------------------------------------|------|-----------------------|-----|-----|------------|
| G1 | Model<br>0=Chiller<br>1=Heat pump,<br>2=Chiller/ Boiler,<br>3=Heat pump/ Boiler, 4=Chiller+Boiler<br>5=Heat pump+Boiler | Flag | 4<br>(Chiller+Boiler) | 0   | 2   | 1          |
| G2 | Number of compressor<br>1=1 compressor,<br>2=2 compressor,<br>3=3 compressor,<br>4=4 compressor                         | Flag | 1                     | 1   | 4   | 1          |
| G3 | On/Off input<br>0=disable, 1=enable                                                                                     | Flag | 0 (disable)           | 0   | 1   | 1          |
| G4 | Cool/ Heat input<br>0=disable, 1=enable                                                                                 | Flag | 0 (disable)           | 0   | 1   | 1          |
| G5 | External alarm input<br>0=disable, 1=enable                                                                             | Flag | 0 (disable)           | 0   | 1   | 1          |
| G6 | Water system for chiller network<br>0=independent, 1=modular                                                            | Flag | 0 (disable)           | 0   | 1   | 1          |
| G7 | Unit number                                                                                                             | Flag | 0                     | 0   | 50  | 1          |

|     | REGULATOR                                                              | Unit   | Default    | Min       | Max      | Resolution |
|-----|------------------------------------------------------------------------|--------|------------|-----------|----------|------------|
| R1  | Cooling set-point                                                      | °C (F) | 12 (53.6)  | 7(44.6)   | 20(68)   | 0.1        |
| R2  | Cooling differential                                                   | °C (F) | 1.5* (2.7) | 0.4 (0.7) | 10 (18)  | 0.1        |
| R3  | Heating set-point                                                      | °C (F) | 40 (104)   | 30(86)    | 50(122)  | 0.1        |
| R4  | Heating differential                                                   | °C (F) | 1.5* (2.7) | 0.4 (0.7) | 10 (18)  | 0.1        |
| R5  | Minimum Cooling set-point                                              | °C (F) | 7 (44.6)   | -20 (-4)  | 20(68)   | 1          |
| R6  | Maximum Cooling set-point                                              | °C (F) | 20 (68)    | 7(44.6)   | 40 (104) | 1          |
| R7  | Minimum Heating set-point                                              | °C (F) | 30 (86)    | -20 (-4)  | 50(122)  | 1          |
| R8  | Maximum Heating set-point                                              | °C (F) | 50 (122)   | 30(86)    | 90 (194) | 1          |
| R9  | Auxiliary heater set-point(threshold below<br>below heating set-point) | °C (F) | 5 (9)      | 0 (0)     | 40 (72)  | 0.1        |
| R10 | Auxiliary heater differential                                          | °C (F) | 2 (3.6)    | 0.4 (0.7) | 10 (18)  | 0.1        |
| R11 | Auto boiler set-point(threshold below<br>Heating set-point)            | °C (F) | 5 (9)      | 0 (0)     | 40 (72)  | 0.1        |
| R12 | Auto boiler differential                                               | °C (F) | 2 (3.6)    | 0.4 (0.7) | 10 (18)  | 0.1        |
| R13 | Auto boiler start time threshold                                       | min    | 30         | 0         | 199      | 1          |

|    | COMPRESSOR                          | Unit   | Default  | Min    | Max       | Resolution |
|----|-------------------------------------|--------|----------|--------|-----------|------------|
| C1 | Compressor minimum run time         | sec    | 120      | 0      | 1990      | 10         |
| C2 | Compressor minimum stop time        | sec    | 180      | 0      | 1990      | 10         |
| C3 | Time interval between two starts    | sec    | 450      | 0      | 1990      | 10         |
| C4 | Start delay between two compressors | sec    | 15       | 0      | 199       | 1          |
| C5 | Pump on →compressor on delay        | sec    | 180      | 0      | 1990      | 10         |
| C6 | Comp off →pump off delay            | sec    | 60       | 0      | 199       | 10         |
| C7 | Discharge cut-off-set-point         | °C (F) | 120(248) | 0 (32) | 150 (302) | 1          |

|    | CONDENSER DEFROST                 | Unit   | Default | Min      | Max      | Resolution |
|----|-----------------------------------|--------|---------|----------|----------|------------|
| D1 | Start defrost temperature         | °C (F) | 0 (32)  | -20 (-4) | 14(57)   | 1          |
| D2 | End defrost temperature           | °C (F) | 14 (57) | 0(32)    | 40 (104) | 1          |
| D3 | Maximum duration of defrost cycle | min    | 10      | 1        | 40       | 1          |
| D4 | Defrost interval time             | min    | 45      | 0        | 199      | 1          |
| D5 | Delay before defrosting           | sec    | 0       | 0        | 1990     | 10         |
| D6 | Delay after defrosting            | sec    | 120     | 0        | 1990     | 10         |

|    | COOL MODE ANTIFREEZE                                          | Unit   | Default        | Min       | Max      | Resolution |
|----|---------------------------------------------------------------|--------|----------------|-----------|----------|------------|
| A1 | Antifreeze heater set-point                                   | °C (F) | 5 (41)         | -40 (-40) | 40 (104) | 1          |
| A2 | Antifreeze heater differential                                | °C (F) | 2 (3.6)        | 0.4 (0.7) | 10 (18)  | 0.1        |
| A3 | Antifreeze sensor select<br>0=Leaving water, 1=Entering water | Flag   | 0<br>(leaving) | 0         | 1        | 1          |
| A4 | Antifreeze alarm set-point                                    | °C (F) | 3 (37)         | -40 (-40) | 40(104)  | 1          |
| A5 | Antifreeze alarm differential                                 | °C (F) | 2 (3.6)        | 0.4 (0.7) | 10 (18)  | 0.1        |

|     | ALARM AND CONTACT                                                       | Unit | Default       | Min | Max | Resolution |
|-----|-------------------------------------------------------------------------|------|---------------|-----|-----|------------|
| P1  | Flow switch confirmation time                                           | sec  | 5             | 0   | 199 | 1          |
| P2  | Flow switch alarm delay at pump start                                   | sec  | 120           | 0   | 199 | 1          |
| P3  | Low pressure alarm delay at compressor start up                         | sec  | 30            | 0   | 199 | 1          |
| P4  | Comp overload alarm reset type<br>0=Manual reset, 1=Auto reset          | Flag | 0<br>(manual) | 0   | 1   | 1          |
| P5  | High pressure alarm reset type<br>0=Manual reset, 1=Auto reset          | Flag | 1<br>(auto)   | 0   | 1   | 1          |
| P6  | Low pressure alarm reset<br>0=Manual reset, 1=Auto reset                | Flag | 1<br>(auto)   | 0   | 1   | 1          |
| P7  | Fan overload alarm reset type<br>0=Manual reset, 1=Auto reset           | Flag | 1<br>(auto)   | 0   | 1   | 1          |
| P8  | Pump overload alarm reset type<br>0=Manual reset, 1=Auto reset          | Flag | 0<br>(manual) | 0   | 1   | 1          |
| P9  | Flow switch alarm reset type<br>0=Manual reset, 1=Auto reset            | Flag | 0<br>(manual) | 0   | 1   | 1          |
| P10 | Auxiliary alarm reset type<br>0=Manual reset, 1=Auto reset              | Flag | 1<br>(auto)   | 0   | 1   | 1          |
| P11 | Antifreeze alarm reset type<br>0=Manual reset, 1=Auto reset             | Flag | 1<br>(auto)   | 0   | 1   | 1          |
| P12 | Comp overload contact type<br>0=Normally close(NC) 1=Normally open(NO)  | Flag | 0<br>(NC)     | 0   | 1   | 1          |
| P13 | High pressure contact type<br>0=Normally close(NC) 1=Normally open(NO)  | Flag | 0<br>(NC)     | 0   | 1   | 1          |
| P14 | Low pressure contact type<br>0=Normally close(NC) 1=Normally open(NO)   | Flag | 0<br>(NC)     | 0   | 1   | 1          |
| P15 | Fan overload contact type<br>0=Normally close(NC) 1=Normally open(NO)   | Flag | 0<br>(NC)     | 0   | 1   | 1          |
| P16 | Pump overload contact type<br>0=Normally close(NC) 1=Normally open(NO)  | Flag | 0<br>(NC)     | 0   | 1   | 1          |
| P17 | Flow switch contact type<br>0=Normally close(NC) 1=Normally open(NO)    | Flag | 0<br>(NC)     | 0   | 1   | 1          |
| P18 | External alarm contact type<br>0=Normally close(NC) 1=Normally open(NO) | Flag | 0<br>(NC)     | 0   | 1   | 1          |
| P19 | Defrost end contact type<br>0=Normally close(NC) 1=Normally open(NO)    | Flag | 0<br>(NC)     | 0   | 1   | 1          |

|    | INVERTER                                          | Unit | Default    | Min | Max | Resolution |
|----|---------------------------------------------------|------|------------|-----|-----|------------|
| V1 | Compressor frequency                              | Hz   | Auto       | 0   | 120 | 1          |
| V2 | EXV Opening                                       | Flag | Auto       | 0   | 480 | 1          |
| V3 | Compressor manual setting<br>0= disable 1= enable | Flag | 0(disable) | 0   | 1   | 1          |
| V4 | EXV Manual setting<br>0=disable 1= enable         | Flag | 0(disable) | 0   | 1   | 1          |
| V5 | Defrost Mode<br>0= disable 1= enable              | Flag | 0(disable) | 0   | 1   | 1          |

## **SPECIAL PRECAUTIONS WHEN DEALING WITH REFRIGERANT R410A UNIT**

### **1) WHAT IS NEW REFRIGERANT R410A?**

R410A is a new HFC refrigerant which does not damage the ozone layer. The working pressure of this new refrigerant is 1.6 times higher than conventional refrigerant (R22), thus proper installation / servicing is essential.

### **2) COMPONENTS**

Mixture of composition by weight : R32(50%) and R125(50%)

### **3) CHARACTERISTIC**

- R410A liquid and vapor components have different compositions when the fluid evaporates or condenses. Hence, when leak occurs and only vapor leaks out, the composition of the refrigerant mixture left in the system will change and subsequently affect the system performance. **DO NOT** add new refrigerant to leaked system. It is recommended that the system be evacuated thoroughly before recharging with R410A.
- When refrigerant R410A is used, the composition will differ depending on whether it is in gaseous or liquid phase.  
Hence when charging R410A, ensure that only liquid is being withdrawn from the cylinder or can. This is to make certain that only original composition of R410A is being charged into the system.
- POE oil is used as lubricant for R410A compressor, which is different from the mineral oil used for R22 compressor.  
Extra precaution must be taken to avoid exposing the R410A system to moist air.

### **4) CHECK LIST BEFORE INSTALLATION / SERVICING**

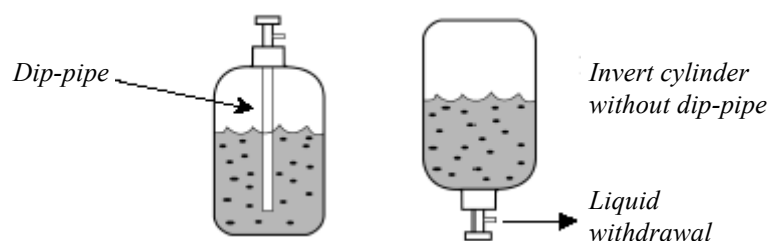
- Tubing  
Refrigerant R410A is more easily affected by dust or moisture compared with R22, make sure to temporarily cover the ends of the tubing prior to installation
- Compressor oil  
No additional charge of compressor oil is permitted.
- Refrigerant  
No other refrigerant other than R410A
- Tools (size of service port is different from R22 system)  
Tools specifically for R410A only (must not be used for R22 or other refrigerant)
  - i) Gauge manifold and charging hose
  - ii) Gas leak detector
  - iii) Refrigerant cylinder/charging cylinder
  - iv) Vacuum pump c/w adapter
  - v) Flare tools
  - vi) Refrigerant recovery machine

### **5) HANDLING AND INSTALLATION GUIDELINES**

Like R22 systems, the handling and installation of R410A system are closely similar. All precautionary measures; such as ensuring no moisture, no dirt or chips in the system, clean brazing using nitrogen, and thorough leak check and vacuuming are equally important requirements. However, due to its hydroscopic POE oil, additional precautions must be taken to ensure optimum and trouble-free system operation.

- a) During installation or servicing, avoid prolong exposure of the internal part of the refrigerant system to moist air. Residual POE oil in the piping and components can absorb moisture from the air.
- b) Ensure that the compressor is not exposed to open air for more than the recommended time specified by its manufacturer (typically less than 10 minutes). Remove the seal-plugs only when the compressor is about to be brazed.
- c) The system should be thoroughly vacuumed to 1.0 Pa ( 700mmHg) or lower. This vacuuming level is more stringent than R22 system so as to ensure no incompressible gas and moisture in the system.

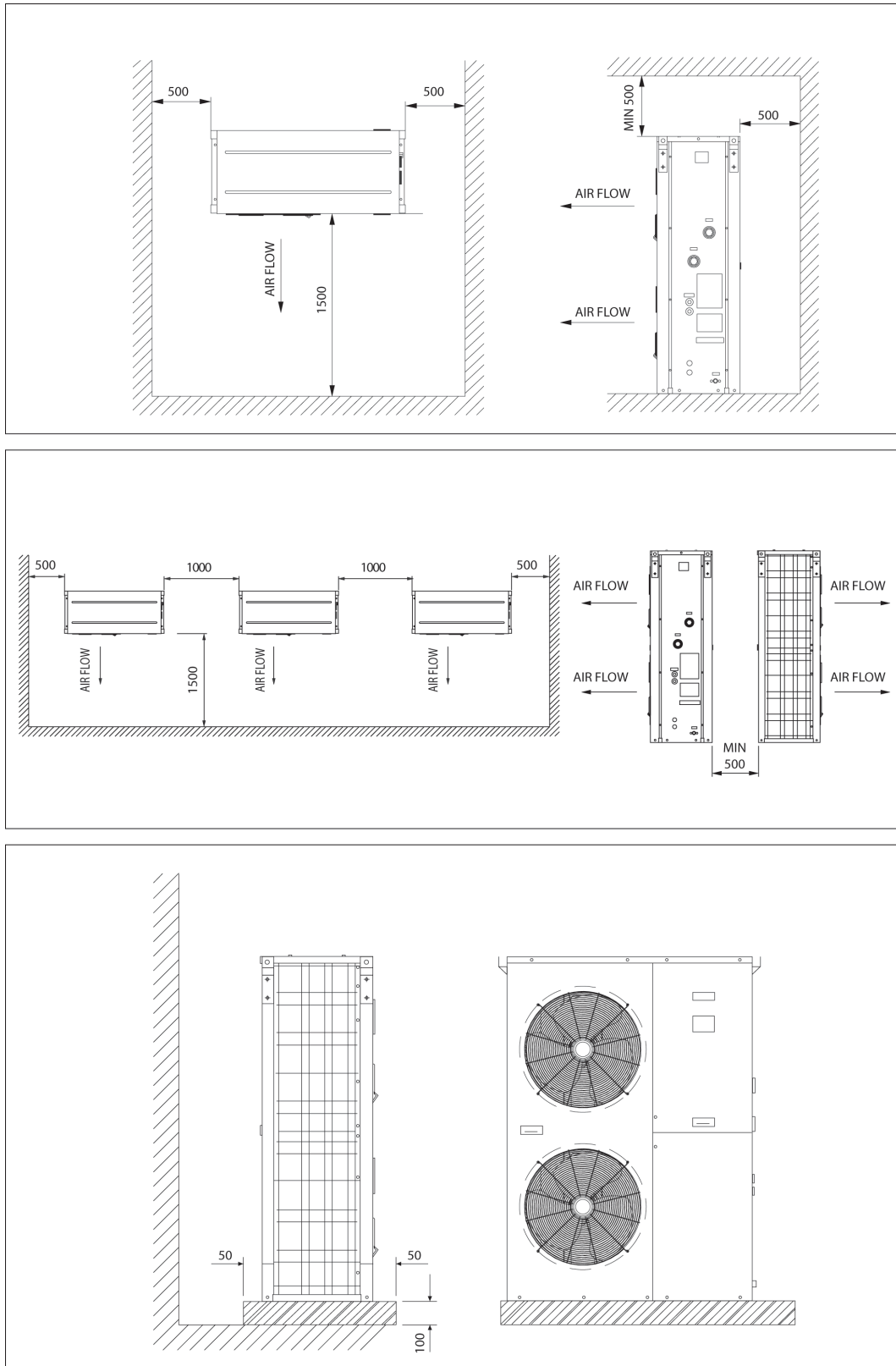
- d) When charging R410A, ensure that only liquid is being withdrawn from the cylinder or can. This is to ensure that only the original composition of R410A is being delivered into the system. The liquid composition can be different from the vapor composition.



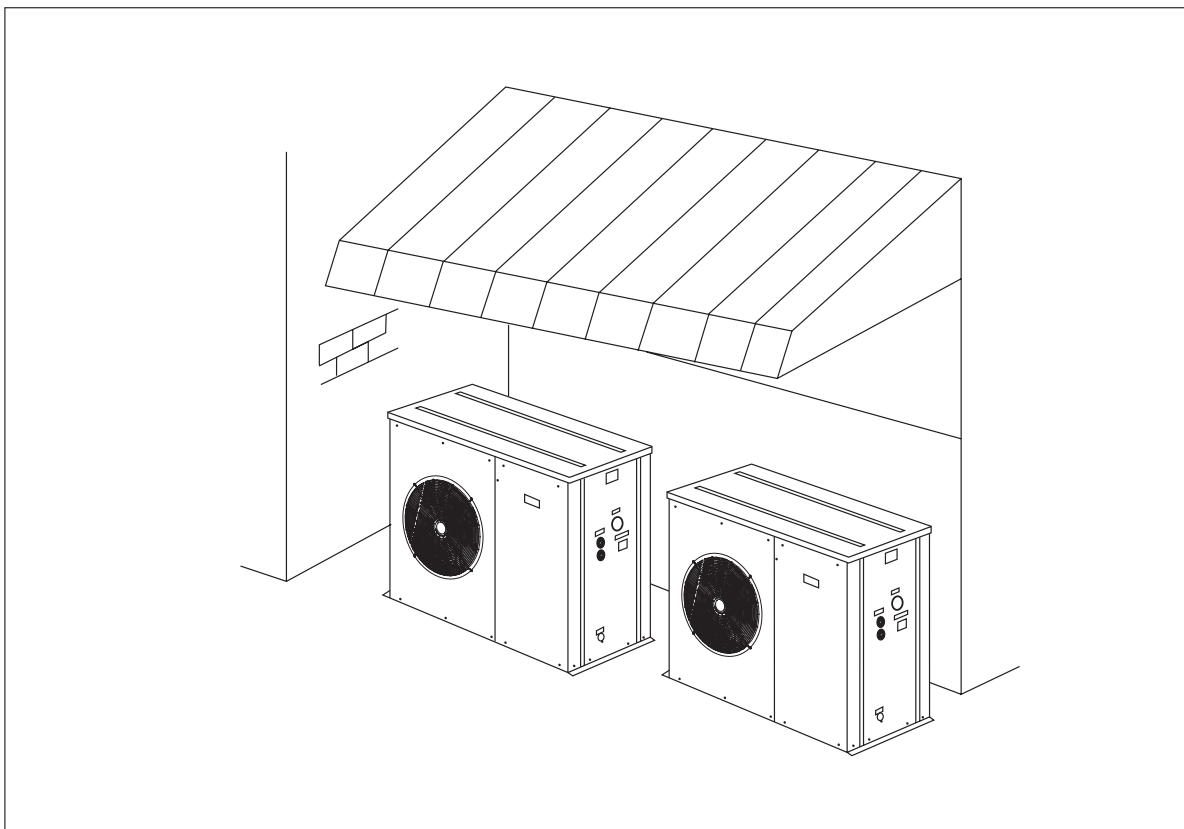
- e) Normally, the R410A cylinder or can is being equipped with a dip-pipe for liquid withdrawal. However, if the dip-pipe is not available, invert the cylinder or can so as to withdraw liquid from the valve at the bottom.

## INSTALLATION

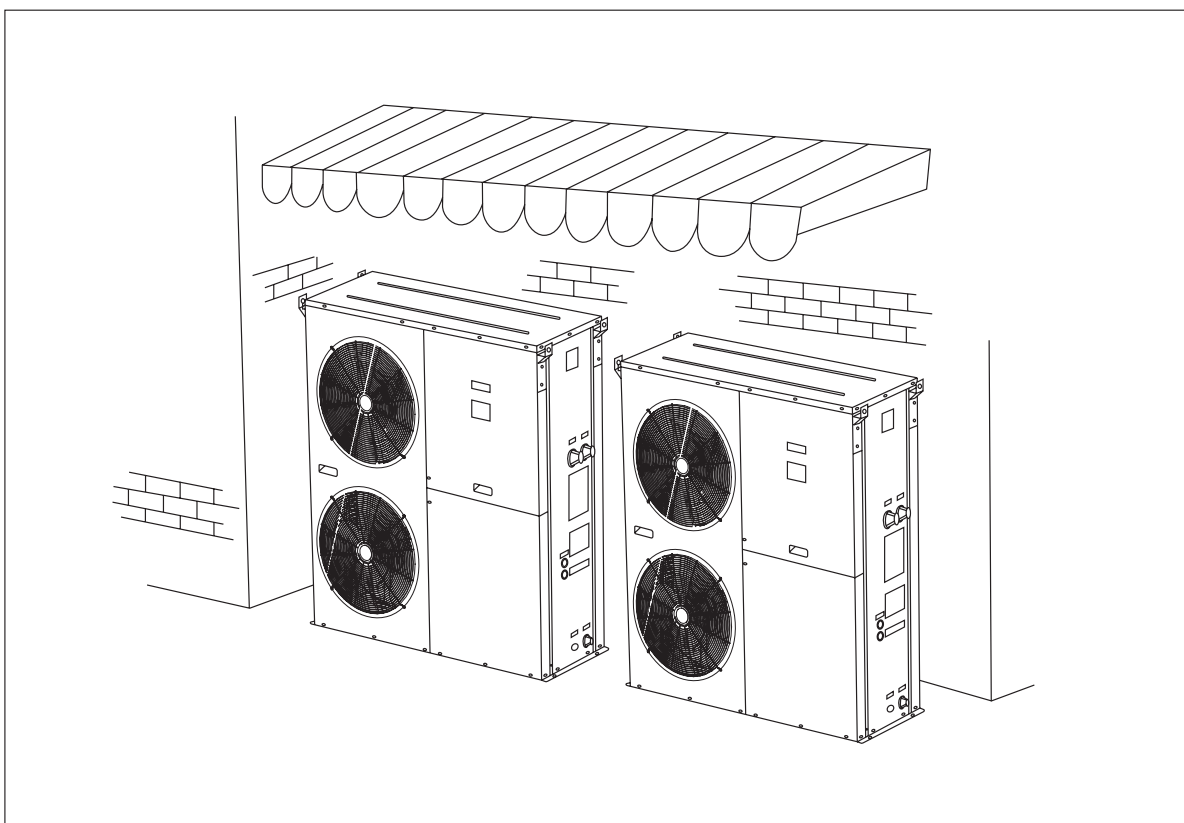
### A5ACV 30/ 55/ 75CR



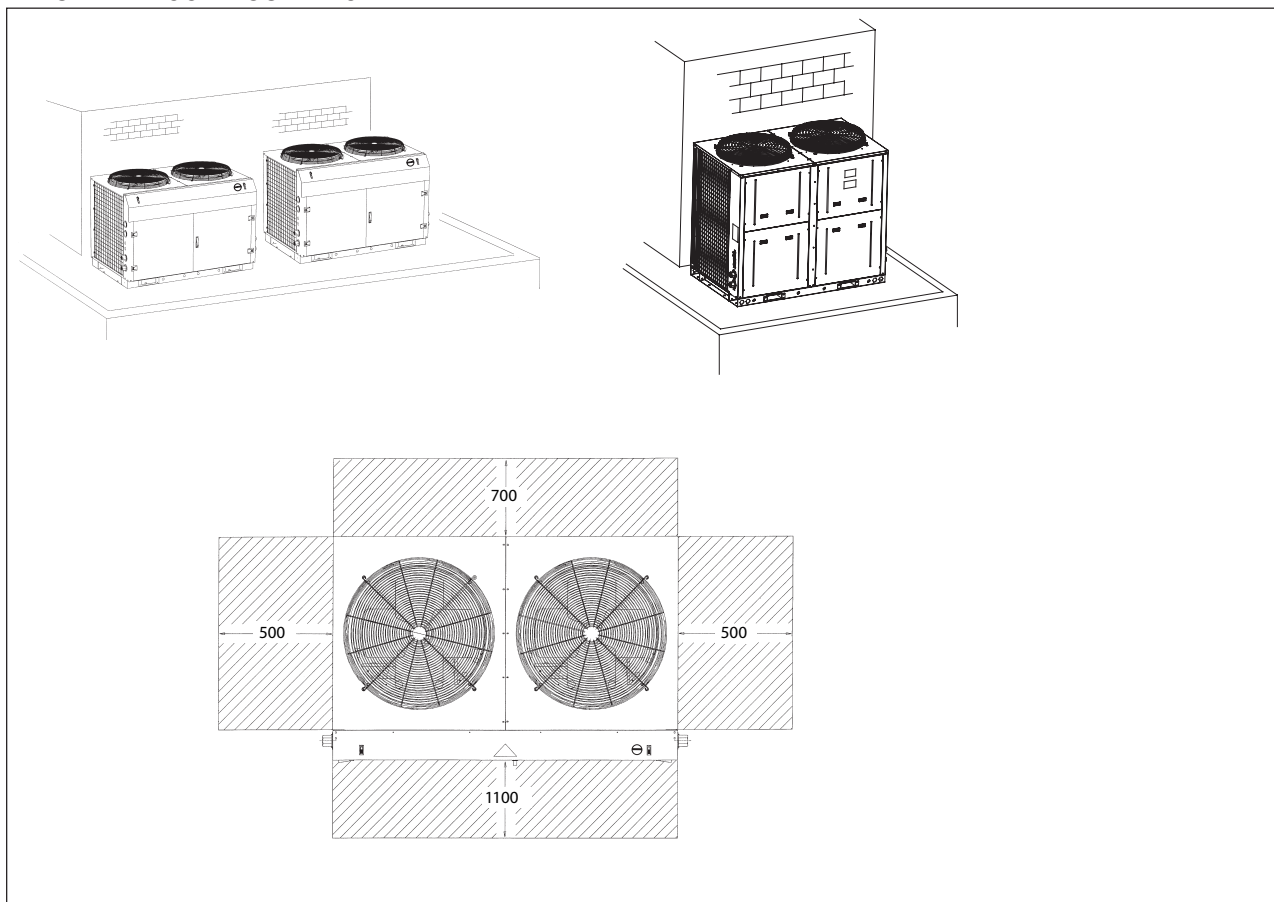
## A5ACV 30CR



## A5ACV 55CR / 75CR



## A5ACV 100 / 135 / 210CR



### SAFETY PRECAUTIONS

Before installing the air conditioner unit, please read the following safety precautions carefully



### Warning

- Installation and maintenance should be performed by qualified persons who are familiar with local code and regulation, and experienced with this type of appliance.
- All field wiring must be installed in accordance with the national wiring regulation.
- Ensure that the rated voltage of the unit corresponds to that of the name plate before commencing wiring work according to the wiring diagram.
- The unit must be GROUNDED to prevent possible hazards due to installation failure.
- All electrical wiring must not touch the refrigerant piping, compressor or any moving parts of the fan motors.
- Confirm that the unit has been switched OFF before installing or servicing the unit.
- Do not touch the compressor or refrigerant piping without wearing gloves.



## Caution

**Please take note of the following important points when installing.**

- **Do not install the unit where leakage of flammable gas may occur.**



If gas leaks and accumulates around the unit, it may cause fire ignition.

- **Ensure that the drainage piping is connected properly.**



If the drainage piping is not connected properly, it may cause water leakage which will dampen the furniture.

- **Do not overcharge the unit.**



This unit is factory pre-charged. Overcharge will cause over-current or damage to the compressor.

- **Ensure that the units panel is closed after service or installation.**



Unsecured panels will cause unit to operate noisily.

## INSTALLATION LOCATION

- Installation work should be done by the authorized dealer or qualified contractor. Never install the unit yourself.
- Make sure there is sufficient airflow around the unit.
- Vibration isolator should be provided to reduce the vibration and noise of the unit.
- There should be sufficient space allocated for servicing and maintenance when installing the unit.

## TRANSPORTATION

- The unit should be lifted using a crane. Ensure that the hanger belts are not touching the coil, top panel and front panel (use protective panel) as shown in Figure 1.
- The bolt of the base and channel support can be removed after putting the unit on the fixed location.

**Figure 1**

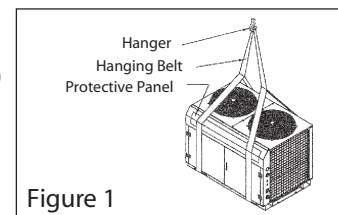


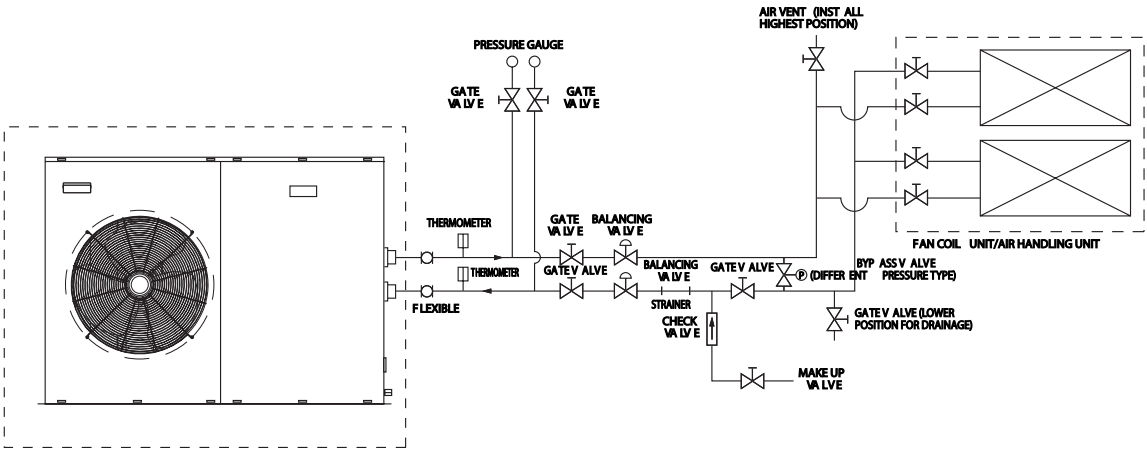
Figure 1

## WATER PIPING AND FITTING

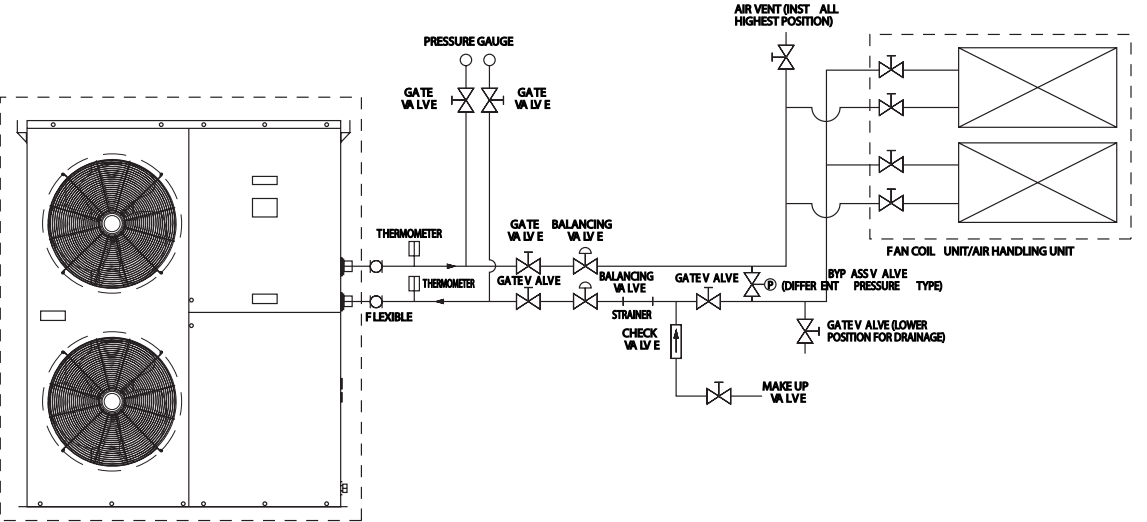
- All water pipe must be insulated to prevent capacity losses and condensation.
- Install a 40-60 mesh strainer to ensure water quality is good.
- Water pipe recommended are black steel pipe and copper pipe.
- During installation, the piping of the unit should be clamp before rotating the installation pipe to reduce the moment induce on the unit piping.
- Users are recommended to install the pipe and accessories as shown in Figure 2.
- An air vent must be installed at the highest position, while a drainage plug at the lowest position of the water circuit. Open the air vent to release any air trap in the water circuit.
- Run the clean water through the water inlet and operate the pump to drain out the dirty water. Clean the strainer after running the pump for 30 minutes.
- Fill up the water circuit after connecting the pipes and equipment. Check water leakage at all connections and joints. Do not start the unit when the system is leaking.
- To optimize the capacity of the system, ensure that the system is free of air bubbles. The air trapped in the system would make the system unbalanced.

A5ACV 30 / 55 / 75CR

A5ACV 30 CR



A5ACV 55CR / 75CR



## A5ACV 100 / 135 / 210CR

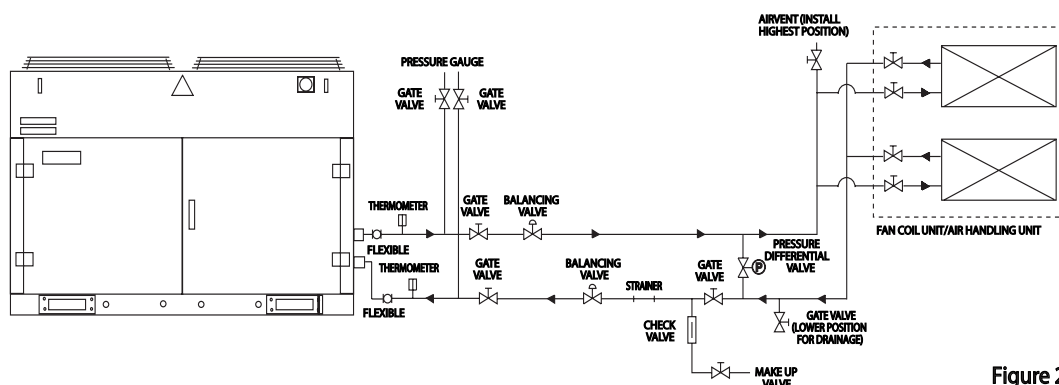


Figure 2



### CAUTION

- Do not allow water to remain in the water pipes if the unit is not operating for a long period. Water must be drained out if the unit is not running during winter. Failing to do so would cause the pipe to crack.
- Do not drink the chilled water in the unit.

### ELECTRICAL AND WIRING

- Refer to the wiring diagram provided on the unit when making electrical wiring.
- Do not ground any electrical equipment to the water piping.
- Install an external isolator switch (if it is not provided) to prevent electrical shock.

### RECOMMENDED FUSE AND CABLE SIZES

| Model                       |                 | A5ACV 30CR | A5ACV 55CR | A5ACV 75CR |
|-----------------------------|-----------------|------------|------------|------------|
| Voltage Range**             |                 | 230/1/50   | 415/3/50   | 415/3/50   |
| Recommended Fuse*           | A               | 36         | 25         | 40         |
| Power Supply Cable Size*    | mm <sup>2</sup> | 10         | 10         | 10         |
| Number of Conductor         |                 | 3          | 5          | 5          |
| Interconnection Cable Size* | mm <sup>2</sup> | 1.5        | 1.5        | 1.5        |

| Model                       |                 | A5ACV 100CR | A5ACV 135CR | A5ACV 210CR |
|-----------------------------|-----------------|-------------|-------------|-------------|
| Voltage Range**             |                 | 415/3/50    | 415/3/50    | 415/3/50    |
| Recommended Fuse*           | A               | 50          | 60          | 100         |
| Power Supply Cable Size*    | mm <sup>2</sup> | 10          | 16          | 25          |
| Number of Conductor         |                 | 5           | 5           | 5           |
| Interconnection Cable Size* | mm <sup>2</sup> | 1.5         | 1.5         | 1.5         |

### IMPORTANT :

- \* The figures shown in the table are for information purpose only. They should be checked and selected to comply with the local/national codes of regulations. This is also subjected to the type of installation and conductors used.
- \*\* The appropriate voltage range should be checked with label data on the unit.



### CAUTION

- All field wiring must be installed in accordance with the national wiring regulation.
- All the terminals and connections must be tightened. Improper connection and fastenings could cause electric shock, short circuit and fire.
- Ensure that the rated voltage of the unit corresponds to that of the name plate before commencing wiring work according to the wiring diagram.
- The unit must be GROUNDED to prevent possible hazards due to insulation failure.
- All electrical wiring must not touch the refrigerant piping, compressor, pump, fan motor or any moving parts of the fan motors.
- Do not operate the chiller with wet hands. It would result in electric shock.
- Do not use fuse of different amperage than stated. Using wire etc. to replace a fuse could cause equipment damage or fire.



## WARNING

- All terminals and connection must be tightened.
- Avoid any wires from touching the refrigerant pipe. Apply insulation if necessary.
- Avoid any wires from touching the moving components such as, fan motor, pump & compressor.

## WATER PIPING SYSTEM SETUP

- Fill up the water circuit after connecting all the pipes and equipment. Perform leak checks for all connections and joints. Do not start the unit when the system is leaking.
- To optimize the capacity of the system, ensure that the system is free of air bubbles. The air trapped in the system would make the system unbalanced.

## REFRIGERANT CIRCUIT

- All mini chiller units are pre-charged with R410A refrigerant. The only piping that needs to be done is the water piping from mini chiller (outdoor) to the fan coil unit (indoor).

## SAFETY AND CAUTIONS

It is advisable to read through all the safety precautions before installing and commissioning of the unit.

- Contact your dealer for installation, reinstallation or dismantling of unit. Improper handling of unit could result in leaks, electrical shock or unit malfunction.
- Use the controller handset to switch on/off the unit. Do not plug off the main power supply directly, it would cause the unit to breakdown.
- Improper connections and fastening could cause electric shock, short circuit and fire.
- Do not introduce foreign objects such as fingers, sticks etc. into the air inlet and outlet.
- Do not spray any chemical agents or flammable agents to the unit. It would cause fire or explosion.
- Do not climb or place objects on top of the mini chiller.
- Do not operate the chiller with wet hands. It would result in electric shock.
- Do not use fuse of different amperage than stated. Using wire, etc. to replace a fuse could cause equipment damage or fire.
- Provide proper grounding for the mini chiller. Do not connect the ground wire to gas piping, water piping, lighting rods or telephone ground wire. Improper grounding could cause electrical shock.
- Do not attempt to do any service or maintenance when unit is operating.
- Do not change the settings of the safety devices.
- Do not consume the chilled water in the unit.
- Do not allow water to remain in the water pipes if the unit is not operating for a long period. Water must be drained out if the unit is not running during winter. Failing to do so would cause the pipe to crack.
- Do not touch the aluminum fin coil. It would damage the coil or cause injury.

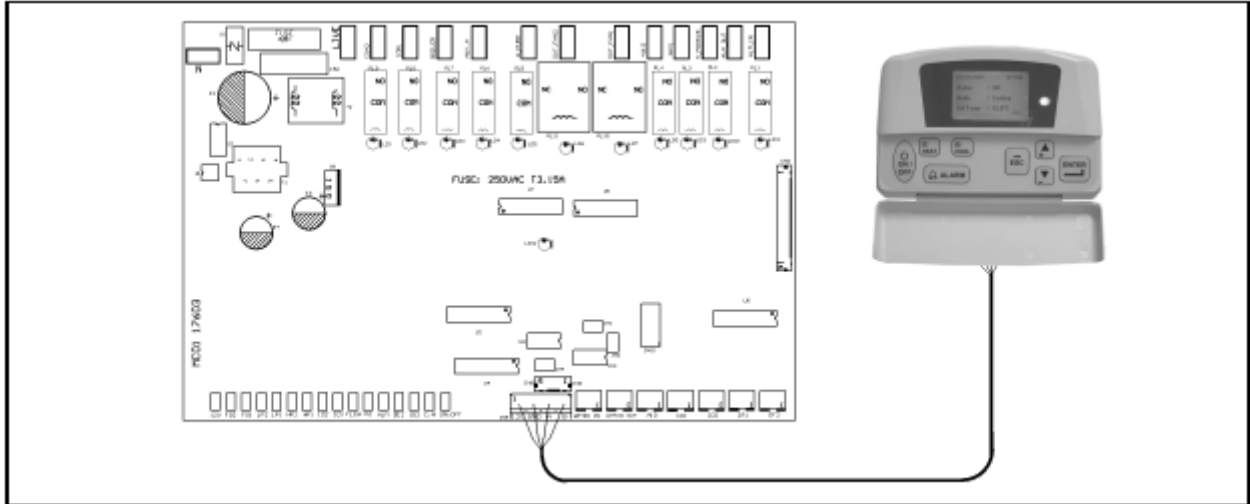


## Caution

- R410A must be charged as liquid. Usually R410A cylinder is equipped with a dip-pipe for liquid withdrawal. If there is no dip-pipe, the cylinder should be inverted so as to withdraw liquid R410A from the valve.
- Do not top-up when servicing leak, as this will reduce the unit performance. Vacuum the unit thoroughly and then charge the unit with fresh R410A according to the amount recommended in the specification.

## CONTROL OPERATION GUIDE

The unit is equipped with a microprocessor controller board. The microprocessor controller is provided to give temperature control for the system by accurately measuring and controlling the water entering and water leaving temperature. The temperature setting in the unit is preset in the factory. It is not recommended to change the setting unless necessary. A wired controller handset is connected to the microprocessor board. Every parameter setting and reading can be observed from the LCD of the handset.



1. Handset location  
The handset is located on a metal bracket behind the right door panel.
2. LED Display (microprocessor board)  
The keypad LED will light up when the unit is turned on.
3. LCD display (controller handset)  
During normal operations, the LCD can display the entering water temperature, the leaving water temperature, the entering water set point temperature, compressor on or off status and outdoor air temperature. When malfunctioning occurred, the LCD would blink. The display would show the faulty parameter and the date and time of the occurrence.
4. Controller functioning specification  
There is a 3 minute delay for the compressor and fan motor to restart (default setting). During defrosting, fan motor is not running.

## 4. SOUND DATA

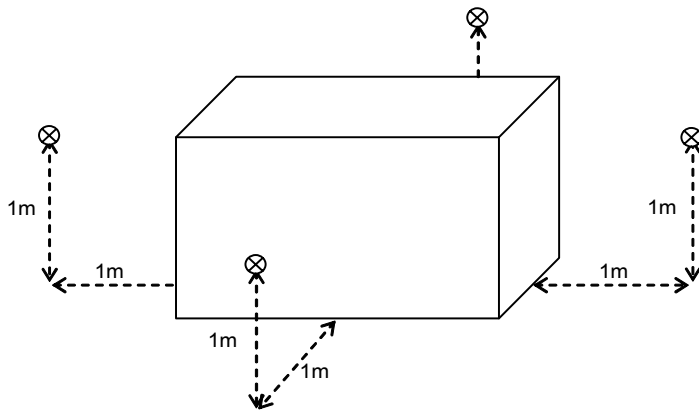
### Sound Pressure Level

| Model       | 1/1 Octave Sound Pressure Level (dB, ref 20μPa) |       |       |      |      |      |      | Overall (dBA) |
|-------------|-------------------------------------------------|-------|-------|------|------|------|------|---------------|
|             | 125Hz                                           | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz |               |
| A5ACV 30CR  | 56                                              | 60    | 59    | 53   | 48   | 43   | 38   | 59            |
| A5ACV 55CR  | 60                                              | 63    | 61    | 56   | 52   | 46   | 42   | 62            |
| A5ACV 75CR  | 65                                              | 65    | 63    | 61   | 57   | 51   | 42   | 65            |
| A5ACV 100CR | 61                                              | 58    | 57    | 58   | 56   | 53   | 53   | 63            |
| A5ACV 135CR | 66                                              | 58    | 58    | 62   | 60   | 58   | 52   | 67            |
| A5ACV 210CR | 68                                              | 68    | 62    | 61   | 59   | 56   | 55   | 67            |

Microphone position : 1m from each side

### Sound Power Level

| Model       | 1/1 Octave Sound Power Level (dB, ref 1pW) |       |       |      |      |      |      | Overall (dBA) |
|-------------|--------------------------------------------|-------|-------|------|------|------|------|---------------|
|             | 125Hz                                      | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz |               |
| A5ACV 30CR  | 67                                         | 74    | 69    | 64   | 59   | 56   | 48   | 71            |
| A5ACV 55CR  | 71                                         | 73    | 71    | 66   | 63   | 56   | 55   | 72            |
| A5ACV 75CR  | 77                                         | 75    | 74    | 71   | 67   | 61   | 53   | 76            |
| A5ACV 100CR | 76                                         | 75    | 72    | 72   | 71   | 67   | 68   | 78            |
| A5ACV 135CR | 80                                         | 73    | 74    | 76   | 75   | 71   | 66   | 81            |
| A5ACV 210CR | 79                                         | 81    | 73    | 72   | 69   | 66   | 65   | 78            |

| Model                                                                               | Measuring location (for Sound Pressure Level)                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| A5ACV 30CR<br>A5ACV 55CR<br>A5ACV 75CR<br>A5ACV 100CR<br>A5ACV 135CR<br>A5ACV 210CR |  <p>Microphone position : 1m from each side</p> |

## 5. SELECTION PROCESS

### WATER PRESSURE DROP VS FLOW RATE

#### MODEL : A5ACV 30CR - COOLING

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Pressure<br>kPa |
|----------------------------------|------------------|--------------------|--------------------------------|
| 1.26                             | 109.00           | 26.56              | 82.44                          |
| 1.30                             | 108.40           | 26.59              | 81.81                          |
| 1.32                             | 108.20           | 28.94              | 79.26                          |
| 1.36                             | 108.00           | 31.54              | 76.46                          |
| 1.39                             | 107.20           | 31.39              | 75.81                          |
| 1.43                             | 106.00           | 31.81              | 74.19                          |
| 1.49                             | 105.00           | 32.30              | 72.70                          |

#### MODEL : A5ACV 30CR - HEATING

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Pressure<br>kPa |
|----------------------------------|------------------|--------------------|--------------------------------|
| 1.89                             | 95.00            | 38.34              | 56.66                          |
| 1.80                             | 96.60            | 35.40              | 61.20                          |
| 1.66                             | 101.00           | 32.45              | 68.55                          |
| 1.44                             | 106.00           | 28.64              | 77.36                          |
| 1.12                             | 111.80           | 18.51              | 93.29                          |

#### MODEL : A5ACV 55CR - COOLING

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Pressure<br>kPa |
|----------------------------------|------------------|--------------------|--------------------------------|
| 1.58                             | 240.00           | 69.64              | 170.36                         |
| 1.97                             | 222.64           | 67.41              | 155.23                         |
| 2.28                             | 207.55           | 67.18              | 140.37                         |
| 2.52                             | 194.34           | 66.91              | 127.43                         |
| 2.68                             | 185.28           | 67.64              | 117.64                         |
| 2.78                             | 180.00           | 68.11              | 111.89                         |
| 2.80                             | 176.98           | 66.33              | 110.65                         |

#### MODEL : A5ACV 55CR - HEATING

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Pressure<br>kPa |
|----------------------------------|------------------|--------------------|--------------------------------|
| 2.82                             | 175.47           | 66.10              | 109.37                         |
| 2.79                             | 179.25           | 68.52              | 110.73                         |
| 2.73                             | 182.26           | 67.30              | 114.96                         |
| 2.44                             | 200.00           | 67.98              | 132.02                         |
| 1.89                             | 226.42           | 67.92              | 158.50                         |

**MODEL : A5ACV 75CR - COOLING / HEATING**

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Presure<br>kPa |
|----------------------------------|------------------|--------------------|-------------------------------|
| 2.20                             | 315.00           | 21.78              | 293.22                        |
| 2.60                             | 300.00           | 31.81              | 268.19                        |
| 3.00                             | 285.00           | 41.17              | 243.83                        |
| 3.40                             | 275.00           | 52.17              | 222.83                        |
| 3.80                             | 265.00           | 65.60              | 199.40                        |

**MODEL : A5ACV100CR - COOLING**

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Presure<br>kPa |
|----------------------------------|------------------|--------------------|-------------------------------|
| 3.98                             | 237.14           | 19.60              | 217.54                        |
| 4.25                             | 228.57           | 25.24              | 203.33                        |
| 4.40                             | 224.29           | 29.39              | 194.90                        |
| 4.79                             | 211.43           | 38.73              | 172.70                        |
| 4.83                             | 210.00           | 39.54              | 170.46                        |
| 4.86                             | 207.80           | 39.60              | 168.20                        |
| 4.90                             | 205.71           | 39.78              | 165.93                        |

**MODEL : A5ACV100CR - HEATING**

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Presure<br>kPa |
|----------------------------------|------------------|--------------------|-------------------------------|
| 6.31                             | 157.06           | 86.93              | 70.13                         |
| 5.90                             | 171.76           | 71.47              | 100.29                        |
| 5.04                             | 202.65           | 45.37              | 157.28                        |
| 4.64                             | 222.94           | 41.41              | 181.53                        |
| 4.24                             | 231.76           | 28.08              | 203.68                        |

**MODEL : A5ACV135CR - COOLING**

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Presure<br>kPa |
|----------------------------------|------------------|--------------------|-------------------------------|
| 5.51                             | 254.55           | 51.25              | 203.30                        |
| 5.89                             | 249.09           | 57.61              | 191.48                        |
| 6.10                             | 244.73           | 60.38              | 184.35                        |
| 6.63                             | 236.36           | 71.16              | 165.20                        |
| 6.68                             | 236.40           | 73.16              | 163.24                        |
| 6.73                             | 234.55           | 73.29              | 161.26                        |
| 6.78                             | 232.73           | 73.47              | 159.26                        |

**MODEL : A5ACV135CR - HEATING**

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Presure<br>kPa |
|----------------------------------|------------------|--------------------|-------------------------------|
| 8.22                             | 201.82           | 104.54             | 97.28                         |
| 7.65                             | 214.55           | 91.34              | 123.21                        |
| 7.13                             | 223.64           | 78.24              | 145.40                        |
| 6.56                             | 234.55           | 66.89              | 167.66                        |
| 6.01                             | 247.27           | 59.81              | 187.46                        |

**MODEL : A5ACV210CR - COOLING / HEATING**

| Water Flow<br>m <sup>3</sup> /hr | Pump Head<br>kPa | System Head<br>kPa | Available Head Presure<br>kPa |
|----------------------------------|------------------|--------------------|-------------------------------|
| 7.68                             | 280.00           | 9.63               | 270.37                        |
| 8.64                             | 270.00           | 14.15              | 255.85                        |
| 9.60                             | 255.00           | 19.44              | 235.56                        |
| 10.56                            | 245.00           | 25.52              | 219.48                        |
| 11.25                            | 225.00           | 30.36              | 194.64                        |

## CORRECTION FACTORS WITH GLYCOL USE

| LWT/ deg C | CAPACITY FACTOR |       |       |       |
|------------|-----------------|-------|-------|-------|
|            | GLYCOL          |       |       |       |
|            | 10              | 20    | 30    | 40    |
| -5         |                 | 0.89  | 0.87  | 0.77  |
| -3.9       |                 | 0.9   | 0.876 | 0.781 |
| -1.1       | 0.925           | 0.925 | 0.892 | 0.796 |
| 1.7        | 0.945           | 0.938 | 0.906 | 0.809 |
| 4.4        | 0.956           | 0.949 | 0.918 | 0.82  |
| 7.2        | 0.965           | 0.958 | 0.927 | 0.829 |
| 10         | 0.962           | 0.957 | 0.926 | 0.828 |

| GLYCOL % | WATER FLOW | PRESSURE DROP |
|----------|------------|---------------|
| 10       | 1.015      | 1.06          |
| 20       | 1.04       | 1.12          |
| 30       | 1.08       | 1.18          |
| 40       | 1.135      | 1.24          |

## 6. ENGINEERING AND PHYSICAL DATA

### GENERAL DATA - HEAT PUMP R410A INVERTER

| MODEL                             |                              |             | A5ACV 30CR                        |              | A5ACV 55CR       |                |      |  |
|-----------------------------------|------------------------------|-------------|-----------------------------------|--------------|------------------|----------------|------|--|
| NOMINAL COOLING CAPACITY          |                              | Btu/h       | 27000                             |              | 50000            |                |      |  |
|                                   |                              | W           | 7913                              |              | 14654            |                |      |  |
| NOMINAL HEATING CAPACITY          |                              | Btu/h       | 33000                             |              | 55000            |                |      |  |
|                                   |                              | W           | 9663                              |              | 16119            |                |      |  |
| NOMINAL TOTAL INPUT POWER         | COOLING                      | W           | 5370                              |              | 7350             |                |      |  |
|                                   | HEATING                      | W           | 4510                              |              | 5850             |                |      |  |
| NOMINAL RUNNING CURRENT           | COOLING                      | A           | 266.0                             |              | 15.8             |                |      |  |
|                                   | HEATING                      | A           | 21.5                              |              | 13.7             |                |      |  |
| POWER SOURCE                      |                              | V/Ph/Hz     | 220-240 / 1 / 50                  |              | 380-415 / 3 / 50 |                |      |  |
| REFRIGERANT TYPE                  |                              |             | R410A                             |              |                  |                |      |  |
| CONTROL                           |                              |             | ELECTRONIC EXPANSION VALVE        |              |                  |                |      |  |
| UNIT DIMENSION                    | HEIGHT                       | mm/in       | 790 / 31.1                        |              | 1410 / 55.5      |                |      |  |
|                                   | WIDTH                        | mm/in       | 1010 / 39.8                       |              | 1010 / 39.8      |                |      |  |
|                                   | DEPTH                        | mm/in       | 460 / 18.1                        |              | 460 / 18.1       |                |      |  |
| PACKING DIMENSION                 | HEIGHT                       | mm/in       | 920 / 36.2                        |              | 1551 / 61.1      |                |      |  |
|                                   | WIDTH                        | mm/in       | 1204 / 47.4                       |              | 1204 / 47.4      |                |      |  |
|                                   | DEPTH                        | mm/in       | 570 / 22.4                        |              | 570 / 22.4       |                |      |  |
| UNIT WEIGHT                       |                              | kg/lb       | 128 / 282                         |              | 195 / 430        |                |      |  |
| SOUND PRESSURE LEVEL              |                              | dBA         | 59                                |              | 62               |                |      |  |
| EVAPORATOR                        |                              |             |                                   |              |                  |                |      |  |
| NOMINAL WATER FLOW                | COOLING                      | l/s / m³/hr | 0.38 ( 1.4 )                      |              | 0.7 ( 2.5 )      |                |      |  |
|                                   | HEATING                      | l/s / m³/hr | 0.46 ( 1.7 )                      |              | 0.73 ( 2.6 )     |                |      |  |
| CONDENSER FAN                     |                              |             |                                   |              |                  |                |      |  |
| TYPE/DRIVE                        |                              |             | PROPELLER / DIRECT                |              |                  |                |      |  |
| QUANTITY                          |                              |             | 1                                 |              | 2                |                |      |  |
| HYDRAULIC KIT                     |                              |             |                                   |              |                  |                |      |  |
| PUMP                              | TYPE                         |             | HORIZONTAL MULTISTAGE END-SUCTION |              |                  |                |      |  |
|                                   | MAX. WATER OPER. PRESSURE    |             | 1000 / 145                        |              |                  |                |      |  |
|                                   | WATER FLOW RATE              | COOLING     | l/s / m³/hr                       | 0.38 ( 1.4 ) |                  | 0.7 ( 2.5 )    |      |  |
|                                   |                              | HEATING     | l/s / m³/hr                       | 0.46 ( 1.7 ) |                  | 0.73 ( 2.6 )   |      |  |
| PIPING                            | INSTALLATION PIPE CONNECITON |             | mm/in                             |              |                  | 25.4 / 1       |      |  |
|                                   | HEAD                         | COOLING     | m                                 |              | 7.7              |                | 13.0 |  |
|                                   |                              | HEATING     | m                                 |              | 7.1              |                | 12.2 |  |
| TANK                              | MATERIAL                     |             | NOT APPLICABLE                    |              |                  |                |      |  |
|                                   | CAPACITY/VOLUME              |             | L / ft³                           |              |                  | NOT APPLICABLE |      |  |
| COMPRESSOR                        |                              |             |                                   |              |                  |                |      |  |
| TYPE                              |                              |             | SCROLL                            |              | SCROLL           |                |      |  |
| STAGE OF CAPACITY CONTROL (Btu/h) |                              |             | 0 - 28700                         |              | 0 - 55000        |                |      |  |
| REFRIGERANT                       |                              |             |                                   |              |                  |                |      |  |
| CHARGING MASS                     |                              | kg/lb       | 2.1                               |              | 4.1              |                |      |  |

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - 12°C / 7°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 35°C AIR AMBIENT TEMPERATURE.

b) HEATING - 40°C / 45°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 7°C AIR AMBIENT TEMPERATURE.

4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.

## GENERAL DATA - HEAT PUMP R410A INVERTER

|                                   |                              |             |                                   |                |
|-----------------------------------|------------------------------|-------------|-----------------------------------|----------------|
| MODEL                             |                              |             | A5ACV 75CR                        |                |
| NOMINAL COOLING CAPACITY          |                              | Btu/h       | 70000                             |                |
|                                   |                              | W           | 20515                             |                |
| NOMINAL HEATING CAPACITY          |                              | Btu/h       | 75000                             |                |
|                                   |                              | W           | 21980                             |                |
| NOMINAL TOTAL INPUT POWER         | COOLING                      | W           | 9050                              |                |
|                                   | HEATING                      | W           | 7900                              |                |
| NOMINAL RUNNING CURRENT           | COOLING                      | A           | 16.6                              |                |
|                                   | HEATING                      | A           | 15.4                              |                |
| POWER SOURCE                      |                              | V/Ph/Hz     | 380-415 / 3 / 50                  |                |
| REFRIGERANT TYPE                  |                              |             | R410A                             |                |
| CONTROL                           |                              |             | ELECTRONIC EXPANSION VALVE        |                |
| UNIT DIMENSION                    | HEIGHT                       | mm/in       | 1460 / 57.5                       |                |
|                                   | WIDTH                        | mm/in       | 1150 / 45.3                       |                |
|                                   | DEPTH                        | mm/in       | 550 / 21.7                        |                |
| PACKING DIMENSION                 | HEIGHT                       | mm/in       | 1626 / 64.0                       |                |
|                                   | WIDTH                        | mm/in       | 1309 / 51.5                       |                |
|                                   | DEPTH                        | mm/in       | 656 / 25.8                        |                |
| UNIT WEIGHT                       |                              | kg/lb       | 200 / 440                         |                |
| SOUND PRESSURE LEVEL              |                              | dBA         | 65                                |                |
| EVAPORATOR                        |                              |             |                                   |                |
| NOMINAL WATER FLOW                | COOLING                      | l/s / m³/hr | 0.95 ( 3.4 )                      |                |
|                                   | HEATING                      | l/s / m³/hr | 1.03 ( 3.7 )                      |                |
| CONDENSER FAN                     |                              |             |                                   |                |
| TYPE/DRIVE                        |                              |             | PROPELLER / DIRECT                |                |
| QUANTITY                          |                              |             | 2                                 |                |
| HYDRAULIC KIT                     |                              |             |                                   |                |
| PUMP                              | TYPE                         |             | HORIZONTAL MULTISTAGE END-SUCTION |                |
|                                   | MAX. WATER OPER. PRESSURE    |             | kPa / psi                         | 1000 / 145     |
|                                   | WATER FLOW RATE              | COOLING     | l/s / m³/hr                       | 0.9 ( 3.4 )    |
|                                   |                              | HEATING     | l/s / m³/hr                       | 1.0 ( 3.7 )    |
| PIPING                            | INSTALLATION PIPE CONNECITON |             | mm/in                             | 25.4 / 1       |
|                                   | HEAD                         | COOLING     | m                                 | 22.4           |
|                                   |                              | HEATING     | m                                 | 20.5           |
| TANK                              | MATERIAL                     |             | NOT APPLICABLE                    |                |
|                                   | CAPACITY/VOLUME              |             | L / ft³                           | NOT APPLICABLE |
| COMPRESSOR                        |                              |             |                                   |                |
| TYPE                              |                              |             | SCROLL                            |                |
| STAGE OF CAPACITY CONTROL (Btu/h) |                              |             | 0 - 75000                         |                |
| REFRIGERANT                       |                              |             |                                   |                |
| CHARGING MASS                     |                              | kg/lb       | 4.8                               |                |

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - 12°C / 7°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 35°C AIR AMBIENT TEMPERATURE.

b) HEATING - 40°C / 45°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 7°C AIR AMBIENT TEMPERATURE.

4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.

## GENERAL DATA - HEAT PUMP R410A INVERTER

| MODEL                             |                              |             | A5ACV 100CR                                 |                  | A5ACV 135CR      |              |
|-----------------------------------|------------------------------|-------------|---------------------------------------------|------------------|------------------|--------------|
| NOMINAL COOLING CAPACITY          |                              |             | Btu/h                                       | 95000            | 131500           |              |
|                                   |                              |             | W                                           | 27840            | 38540            |              |
| NOMINAL HEATING CAPACITY          |                              |             | Btu/h                                       | 100000           | 141500           |              |
|                                   |                              |             | W                                           | 29310            | 41470            |              |
| NOMINAL TOTAL INPUT POWER         | COOLING                      | W           | 12000                                       | 15750            |                  |              |
|                                   | HEATING                      | W           | 11400                                       | 16250            |                  |              |
| NOMINAL RUNNING CURRENT           | COOLING                      | A           | 24.4                                        | 30.0             |                  |              |
|                                   | HEATING                      | A           | 23.8                                        | 31.1             |                  |              |
| POWER SOURCE                      |                              |             | V/Ph/Hz                                     | 380-415 / 3 / 50 |                  |              |
| REFRIGERANT TYPE                  |                              |             | R410A                                       |                  |                  |              |
| CONTROL                           |                              |             | ELECTRONIC EXPANSION VALVE / CAPILLARY TUBE |                  |                  |              |
| UNIT DIMENSION                    | HEIGHT                       | mm/in       | 1245 / 49.0                                 |                  | 1245 / 49.0      |              |
|                                   | WIDTH                        | mm/in       | 1500 / 59.1                                 |                  | 1800 / 70.9      |              |
|                                   | DEPTH                        | mm/in       | 900 / 35.4                                  |                  | 1150 / 45.3      |              |
| PACKING DIMENSION                 | HEIGHT                       | mm/in       | 1452 / 57.2                                 |                  | 1452 / 57.2      |              |
|                                   | WIDTH                        | mm/in       | 1732 / 68.2                                 |                  | 2032 / 80.0      |              |
|                                   | DEPTH                        | mm/in       | 1032 / 40.6                                 |                  | 1282 / 50.5      |              |
| UNIT WEIGHT                       |                              | kg/lb       | 405 / 893                                   |                  | 525 / 1157       |              |
| SOUND PRESSURE LEVEL              |                              | dBA         | 63                                          |                  | 67               |              |
| EVAPORATOR                        |                              |             |                                             |                  |                  |              |
| NOMINAL WATER FLOW                | COOLING                      | l/s / m³/hr | 1.33 ( 4.8 )                                |                  | 1.84 ( 6.6 )     |              |
|                                   | HEATING                      | l/s / m³/hr | 1.40 ( 5.0 )                                |                  | 1.98 ( 7.1 )     |              |
| CONDENSER FAN                     |                              |             |                                             |                  |                  |              |
| TYPE/DRIVE                        |                              |             | PROPELLER / DIRECT                          |                  |                  |              |
| QUANTITY                          |                              |             | 2                                           |                  | 2                |              |
| HYDRAULIC KIT                     |                              |             |                                             |                  |                  |              |
| PUMP                              | TYPE                         |             | HORIZONTAL MULTISTAGE END-SUCTION           |                  |                  |              |
|                                   | MAX. WATER OPER. PRESSURE    |             | 1000 / 145                                  |                  |                  |              |
|                                   | WATER FLOW RATE              | COOLING     | l/s / m³/hr                                 | 1.33 ( 4.8 )     |                  | 1.84 ( 6.6 ) |
|                                   |                              | HEATING     | l/s / m³/hr                                 | 1.40 ( 5.0 )     |                  | 1.98 ( 7.1 ) |
| PIPING                            | INSTALLATION PIPE CONNECITON |             | 31.75 / 1 1/4                               |                  |                  |              |
|                                   | HEAD                         | COOLING     | m                                           | 17.6             |                  | 16.8         |
|                                   |                              | HEATING     | m                                           | 16.0             |                  | 14.8         |
| TANK                              | MATERIAL                     |             | NOT APPLICABLE                              |                  |                  |              |
|                                   | CAPACITY/VOLUME              |             | NOT APPLICABLE                              |                  |                  |              |
| COMPRESSOR                        |                              |             |                                             |                  |                  |              |
| TYPE                              |                              |             | SCROLL                                      |                  | SCROLL           |              |
| STAGE OF CAPACITY CONTROL (Btu/h) |                              |             | 73000 - 122000                              |                  | 99000 - 149000   |              |
| REFRIGERANT                       |                              |             |                                             |                  |                  |              |
| CHARGING MASS                     |                              | kg/lb       | 4.7 x2 / 10.4 x2                            |                  | 6.0 x2 / 13.2 x2 |              |

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - 12°C / 7°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 35°C AIR AMBIENT TEMPERATURE.

b) HEATING - 40°C / 45°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 7°C AIR AMBIENT TEMPERATURE.

4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.

## GENERAL DATA - HEAT PUMP R410A INVERTER

|                                   |                              |             |                                   |                |
|-----------------------------------|------------------------------|-------------|-----------------------------------|----------------|
| MODEL                             |                              |             | A5ACV 210CR                       |                |
| NOMINAL COOLING CAPACITY          |                              | Btu/h       | 200000                            |                |
|                                   |                              | W           | 58620                             |                |
| NOMINAL HEATING CAPACITY          |                              | Btu/h       | 210000                            |                |
|                                   |                              | W           | 61550                             |                |
| NOMINAL TOTAL INPUT POWER         | COOLING                      | W           | 22300                             |                |
|                                   | HEATING                      | W           | 21800                             |                |
| NOMINAL RUNNING CURRENT           | COOLING                      | A           | 44.6                              |                |
|                                   | HEATING                      | A           | 44.6                              |                |
| POWER SOURCE                      |                              | V/Ph/Hz     | 380-415 / 3 / 50                  |                |
| REFRIGERANT TYPE                  |                              |             | R410A                             |                |
| CONTROL                           |                              |             | ELECTRONIC EXPANSION VALVE        |                |
| UNIT DIMENSION                    | HEIGHT                       | mm/in       | 1786 / 70.3                       |                |
|                                   | WIDTH                        | mm/in       | 2093 / 82.4                       |                |
|                                   | DEPTH                        | mm/in       | 1192 / 46.9                       |                |
| PACKING DIMENSION                 | HEIGHT                       | mm/in       | 1975 / 77.7                       |                |
|                                   | WIDTH                        | mm/in       | 2176 / 85.6                       |                |
|                                   | DEPTH                        | mm/in       | 1242 / 48.9                       |                |
| UNIT WEIGHT                       |                              | kg/lb       | 682 / 1504                        |                |
| SOUND PRESSURE LEVEL              |                              | dBA         | 67                                |                |
| EVAPORATOR                        |                              |             |                                   |                |
| NOMINAL WATER FLOW                | COOLING                      | l/s / m³/hr | 2.66 ( 9.6 )                      |                |
|                                   | HEATING                      | l/s / m³/hr | 2.86 ( 10.3 )                     |                |
| CONDENSER FAN                     |                              |             |                                   |                |
| TYPE/DRIVE                        |                              |             | PROPELLER / DIRECT                |                |
| QUANTITY                          |                              |             | 2                                 |                |
| HYDRAULIC KIT                     |                              |             |                                   |                |
| PUMP                              | TYPE                         |             | HORIZONTAL MULTISTAGE END-SUCTION |                |
|                                   | MAX. WATER OPER. PRESSURE    |             | kPa / psi                         | 1000 / 145     |
|                                   | WATER FLOW RATE              | COOLING     | l/s / m³/hr                       | 2.66 ( 9.6 )   |
|                                   |                              | HEATING     | l/s / m³/hr                       | 2.86 ( 10.3 )  |
| PIPING                            | INSTALLATION PIPE CONNECITON |             | mm/in                             | 38 / 1 1/2     |
|                                   | HEAD                         | COOLING     | m                                 | 22.0           |
|                                   |                              | HEATING     | m                                 | 20.0           |
| TANK                              | MATERIAL                     |             | NOT APPLICABLE                    |                |
|                                   | CAPACITY/VOLUME              |             | L / ft³                           | NOT APPLICABLE |
| COMPRESSOR                        |                              |             |                                   |                |
| TYPE                              |                              |             | SCROLL                            |                |
| STAGE OF CAPACITY CONTROL (Btu/h) |                              |             | 0 - 210000                        |                |
| REFRIGERANT                       |                              |             |                                   |                |
| CHARGING MASS                     | COOLING                      | kg/lb       | 9.5 / 20.9                        |                |
|                                   | HEATING                      | kg/lb       | 8.5 / 18.7                        |                |

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a) COOLING - 12°C / 7°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 35°C AIR AMBIENT TEMPERATURE.

b) HEATING - 40°C / 45°C ENTERING / LEAVING EVAPORATOR WATER TEMPERATURE, 7°C AIR AMBIENT TEMPERATURE.

4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS B 8615 STANDARD. POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE UNIT.

## COMPONENTS DATA

| MODEL               |                          |                 | A5ACV 30CR                        | A5ACV 55CR           |
|---------------------|--------------------------|-----------------|-----------------------------------|----------------------|
| CONDENSER FAN       | TYPE                     |                 | PROPELLER                         |                      |
|                     | Q'TY                     |                 | 1                                 | 2                    |
|                     | MATERIAL                 |                 | METAL                             |                      |
|                     | DRIVE                    |                 | DIRECT                            |                      |
|                     | DIAMETER                 | mm/in           | 457.2 / 18                        |                      |
| CONDENSER FAN MOTOR | TYPE                     |                 | INDUCTION                         |                      |
|                     | Q'TY                     |                 | 1                                 | 2                    |
|                     | INDEX OF PROTECTION (IP) |                 | NA                                | NA                   |
| COMPRESSOR          | TYPE                     |                 | AC INVERTER SCROLL                |                      |
|                     | OIL TYPE                 |                 | POE                               | POE                  |
|                     | OIL AMOUNT               | INVERTER SCROLL | 1700 / 57.5                       | 2300 / 77.8          |
|                     | cm <sup>3</sup> / fl.oz. |                 |                                   |                      |
| CONDENSER COIL      | TYPE                     |                 | CROSS FINNED TUBES                |                      |
|                     | TUBE                     | MATERIAL        |                                   | INNER GROOVED COPPER |
|                     |                          | DIAMETER        | mm/in                             | 9.52 / 3/8           |
|                     |                          | THICKNESS       | mm/in                             | 0.372 / 0.015        |
|                     | FIN                      | MATERIAL        |                                   | CORRUGATED ALUMINIUM |
|                     |                          | THICKNESS       | mm/in                             | 0.12 / 0.005         |
|                     |                          | FACE AREA       | m <sup>2</sup> / ft <sup>2</sup>  | 0.65 / 7.0           |
|                     |                          | ROW             | 2                                 |                      |
|                     |                          | FIN PER INCH    | 16                                |                      |
| BPHE                | TYPE                     |                 | BRAZED PLATE HEAT EXCHANGER       |                      |
|                     | MATERIAL                 |                 | STAINLESS STEEL                   |                      |
| PUMP                | TYPE                     |                 | HORIZONTAL MULTISTAGE END-SUCTION |                      |
|                     | MATERIAL                 |                 | CAST IRON & STAINLESS STEEL       |                      |
| CASING              | MATERIAL                 |                 | ELECTRO-GALVANIZED MILD STEEL     |                      |
|                     | COLOUR                   |                 | LIGHT GREY- PE775104              |                      |

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| MODEL               |                          |                 | A5ACV 75CR                        |                      |
|---------------------|--------------------------|-----------------|-----------------------------------|----------------------|
| CONDENSER FAN       | TYPE                     |                 | PROPELLER                         |                      |
|                     | Q'TY                     |                 | 2                                 |                      |
|                     | MATERIAL                 |                 | METAL                             |                      |
|                     | DRIVE                    |                 | DIRECT                            |                      |
|                     | DIAMETER                 | mm/in           | 609.6 / 24                        |                      |
| CONDENSER FAN MOTOR | TYPE                     |                 | INDUCTION                         |                      |
|                     | Q'TY                     |                 | 2                                 |                      |
|                     | INDEX OF PROTECTION (IP) |                 | NA                                |                      |
| COMPRESSOR          | TYPE                     |                 | AC INVERTER SCROLL                |                      |
|                     | OIL TYPE                 |                 | POE                               |                      |
|                     | OIL AMOUNT               | INVERTER SCROLL | 2300 / 77.8                       |                      |
|                     | cm <sup>3</sup> / fl.oz. |                 |                                   |                      |
| CONDENSER COIL      | TYPE                     |                 | CROSS FINNED TUBES                |                      |
|                     | TUBE                     | MATERIAL        |                                   | INNER GROOVED COPPER |
|                     |                          | DIAMETER        | mm/in                             | 9.52 / 3/8           |
|                     |                          | THICKNESS       | mm/in                             | 0.372 / 0.015        |
|                     | FIN                      | MATERIAL        |                                   | CORRUGATED ALUMINIUM |
|                     |                          | THICKNESS       | mm/in                             | 0.12 / 0.005         |
|                     |                          | FACE AREA       | m <sup>2</sup> / ft <sup>2</sup>  | 1.27 / 13.7          |
|                     |                          | ROW             | 2                                 |                      |
|                     |                          | FIN PER INCH    | 16                                |                      |
| BPHE                | TYPE                     |                 | BRAZED PLATE HEAT EXCHANGER       |                      |
|                     | MATERIAL                 |                 | STAINLESS STEEL                   |                      |
| PUMP                | TYPE                     |                 | HORIZONTAL MULTISTAGE END-SUCTION |                      |
|                     | MATERIAL                 |                 | CAST IRON & STAINLESS STEEL       |                      |
| CASING              | MATERIAL                 |                 | ELECTRO-GALVANIZED MILD STEEL     |                      |
|                     | COLOUR                   |                 | LIGHT GREY- PE775104              |                      |

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## COMPONENTS DATA

| MODEL               |                          |                          | A5ACV 100CR                       | A5ACV 135CR          |
|---------------------|--------------------------|--------------------------|-----------------------------------|----------------------|
| CONDENSER FAN       | TYPE                     |                          | PROPELLER                         |                      |
|                     | Q'TY                     |                          | 2                                 |                      |
|                     | MATERIAL                 |                          | METAL                             |                      |
|                     | DRIVE                    |                          | DIRECT                            |                      |
|                     | DIAMETER                 | mm/in                    | 600 / 24                          | 660 / 26             |
| CONDENSER FAN MOTOR | TYPE                     |                          | INDUCTION                         |                      |
|                     | Q'TY                     |                          | 2                                 |                      |
|                     | INDEX OF PROTECTION (IP) |                          | IP44                              | IP44                 |
| COMPRESSOR 1        | TYPE                     |                          | AC INVERTER SCROLL                | AC INVERTER SCROLL   |
|                     | OIL TYPE                 |                          | ME56                              |                      |
|                     | OIL AMOUNT               | cm <sup>3</sup> / fl.oz. | 2300 / 77.8                       | 2300 / 77.8          |
| COMPRESSOR 2        | TYPE                     |                          | SCROLL                            |                      |
|                     | OIL TYPE                 |                          | POE                               |                      |
|                     | OIL AMOUNT               | cm <sup>3</sup> / fl.oz. | 1952 / 66.0                       | -                    |
| CONDENSER COIL      | TYPE                     |                          | CROSS FINNED TUBES                |                      |
|                     | TUBE                     | MATERIAL                 |                                   | INNER GROOVED COPPER |
|                     |                          | DIAMETER                 | mm/in                             | 9.52 / 3/8           |
|                     |                          | THICKNESS                | mm/in                             | 0.28 / 0.011         |
|                     | FIN                      | MATERIAL                 |                                   | CORRUGATED ALUMINIUM |
|                     |                          | THICKNESS                | mm/in                             | 0.11 / 0.004         |
|                     |                          | FACE AREA                | m <sup>2</sup> / ft <sup>2</sup>  | 1.39 / 14.9          |
|                     |                          | ROW                      |                                   | 2                    |
|                     |                          | FIN PER INCH             |                                   | 14                   |
| BPHE                | TYPE                     |                          | BRAZED PLATE HEAT EXCHANGER       |                      |
|                     | MATERIAL                 |                          | STAINLESS STEEL                   |                      |
| PUMP                | TYPE                     |                          | HORIZONTAL MULTISTAGE END-SUCTION |                      |
|                     | MATERIAL                 |                          | CAST IRON & STAINLESS STEEL       |                      |
| CASING              | MATERIAL                 |                          | ELECTRO-GALVANIZED MILD STEEL     |                      |
|                     | COLOUR                   |                          | LIGHT GREY- PE775104              |                      |

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## COMPONENTS DATA

| MODEL               |                          |                          |                                  | A5ACV 210CR                       |  |                             |
|---------------------|--------------------------|--------------------------|----------------------------------|-----------------------------------|--|-----------------------------|
| CONDENSER FAN       | TYPE                     |                          |                                  | PROPELLER                         |  |                             |
|                     | Q'TY                     |                          |                                  | 2                                 |  |                             |
|                     | MATERIAL                 |                          |                                  | METAL                             |  |                             |
|                     | DRIVE                    |                          |                                  | DIRECT                            |  |                             |
|                     | DIAMETER                 | mm/in                    |                                  | 812 / 32                          |  |                             |
| CONDENSER FAN MOTOR | TYPE                     |                          |                                  | INDUCTION                         |  |                             |
|                     | Q'TY                     |                          |                                  | 2                                 |  |                             |
|                     | INDEX OF PROTECTION (IP) |                          |                                  | NA                                |  |                             |
| COMPRESSOR 1        | TYPE                     |                          |                                  | AC INVERTER SCROLL                |  |                             |
|                     | OIL TYPE                 |                          |                                  | ME56                              |  |                             |
|                     | OIL AMOUNT               | cm <sup>3</sup> / fl.oz. |                                  | 2300 / 77.8                       |  |                             |
|                     | TYPE                     |                          |                                  | SCROLL                            |  |                             |
| COMPRESSOR 2        | OIL TYPE                 |                          |                                  | ME56                              |  |                             |
|                     | OIL AMOUNT               | cm <sup>3</sup> / fl.oz. |                                  | 1700 / 57.5                       |  |                             |
|                     | TYPE                     |                          |                                  | SCROLL                            |  |                             |
| COMPRESSOR 3        | OIL TYPE                 |                          |                                  | POE                               |  |                             |
|                     | OIL AMOUNT               | cm <sup>3</sup> / fl.oz. |                                  | 3257 / 110.2                      |  |                             |
|                     | TYPE                     |                          |                                  | CROSS FINNED TUBES                |  |                             |
| CONDENSER COIL      | TUBE                     | MATERIAL                 |                                  | INNER GROOVED COPPER              |  |                             |
|                     |                          | DIAMETER                 | mm/in                            | 9.52 / 3/8                        |  |                             |
|                     |                          | THICKNESS                | mm/in                            | 0.28 / 0.011                      |  |                             |
|                     |                          | CORRUGATED ALUMINIUM     |                                  |                                   |  |                             |
|                     | FIN                      | THICKNESS                | mm/in                            | 0.11 / 0.004                      |  |                             |
|                     |                          | FACE AREA                | m <sup>2</sup> / ft <sup>2</sup> | 3.07 / 33.0                       |  |                             |
|                     |                          | ROW                      |                                  | 2                                 |  |                             |
|                     |                          | FIN PER INCH             |                                  | 16                                |  |                             |
|                     |                          | BPHE                     | TYPE                             |                                   |  | BRAZED PLATE HEAT EXCHANGER |
|                     | MATERIAL                 |                          |                                  | STAINLESS STEEL                   |  |                             |
| PUMP                | TYPE                     |                          |                                  | HORIZONTAL MULTISTAGE END-SUCTION |  |                             |
|                     | MATERIAL                 |                          |                                  | CAST IRON & STAINLESS STEEL       |  |                             |
| CASING              | MATERIAL                 |                          |                                  | ELECTRO-GALVANIZED MILD STEEL     |  |                             |
|                     | COLOUR                   |                          |                                  | LIGHT GREY- PE775104              |  |                             |

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## SAFETY DEVICES

| MODEL         |                               |       |          | A5ACV 30CR        | A5ACV 55CR        |
|---------------|-------------------------------|-------|----------|-------------------|-------------------|
| SAFETY DEVICE | HIGH PRESSURE SWITCH          | TYPE  |          | NC                | NC                |
|               |                               | OPEN  | Pa / psi | 4140 / 600        | 4140 / 600        |
|               |                               | CLOSE | Pa / psi | 3312 / 480        | 3312 / 480        |
|               | LOW PRESSURE SWITCH           | TYPE  |          | NC                | NC                |
|               |                               | OPEN  | Pa / psi | 124 / 18          | 124 / 18          |
|               |                               | CLOSE | Pa / psi | 193 / 28          | 193 / 28          |
|               | PHASE PROTECTION              |       |          | BUILT IN ON BOARD | BUILT IN ON BOARD |
|               | DIFFERENTIAL PRESSURE SWITCH  |       |          | YES               | YES               |
|               | ANTI-FREEZE PROTECTION SENSOR |       |          | YES               | YES               |
|               | DISCH. THERMOSTAT SETTING     |       | °C / °F  | 110 / 230         | 110 / 230         |
|               | OVER PRESSURE RELIEF VALVE    |       |          | YES               | YES               |
|               | ANTI-FREEZE HEATER ON BPHE    |       |          | YES               | YES               |
|               | PUMP OLP                      |       |          | YES               | YES               |
|               | COMPRESSOR OLP                |       |          | YES               | YES               |

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| MODEL         |                               |       |          | A5ACV 75CR        |
|---------------|-------------------------------|-------|----------|-------------------|
| SAFETY DEVICE | HIGH PRESSURE SWITCH          | TYPE  |          | NC                |
|               |                               | OPEN  | Pa / psi | 4140 / 600        |
|               |                               | CLOSE | Pa / psi | 3312 / 480        |
|               | LOW PRESSURE SWITCH           | TYPE  |          | NC                |
|               |                               | OPEN  | Pa / psi | 124 / 18          |
|               |                               | CLOSE | Pa / psi | 193 / 28          |
|               | PHASE PROTECTION              |       |          | BUILT IN ON BOARD |
|               | DIFFERENTIAL PRESSURE SWITCH  |       |          | YES               |
|               | ANTI-FREEZE PROTECTION SENSOR |       |          | YES               |
|               | DISCH. THERMOSTAT SETTING     |       | °C / °F  | 110 / 230         |
|               | OVER PRESSURE RELIEF VALVE    |       |          | YES               |
|               | ANTI-FREEZE HEATER ON BPHE    |       |          | YES               |
|               | PUMP OLP                      |       |          | YES               |
|               | COMPRESSOR OLP                |       |          | YES               |

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| MODEL         |                               |       |          | A5ACV 100CR       | A5ACV 135CR |
|---------------|-------------------------------|-------|----------|-------------------|-------------|
| SAFETY DEVICE | HIGH PRESSURE SWITCH          | TYPE  |          | NC                | NC          |
|               |                               | OPEN  | Pa / psi | 4140 / 600        | 4140 / 600  |
|               |                               | CLOSE | Pa / psi | 3312 / 480        | 3312 / 480  |
|               | LOW PRESSURE SWITCH           | TYPE  |          | NC                | NC          |
|               |                               | OPEN  | Pa / psi | 124 / 18          | 124 / 18    |
|               |                               | CLOSE | Pa / psi | 193 / 28          | 193 / 28    |
|               | PHASE PROTECTION              |       |          | BUILT IN ON BOARD |             |
|               | DIFFERENTIAL PRESSURE SWITCH  |       |          | YES               | YES         |
|               | ANTI-FREEZE PROTECTION SENSOR |       |          | YES               | YES         |
|               | DISCH. THERMOSTAT SETTING     |       | °C / °F  | 110 / 230         | 110 / 230   |
|               | OVER PRESSURE RELIEF VALVE    |       |          | YES               | YES         |
|               | ANTI-FREEZE HEATER ON BPHE    |       |          | YES               | YES         |
|               | PUMP OLP                      |       |          | YES               | YES         |
|               | COMPRESSOR OLP                |       |          | YES               | YES         |

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| MODEL         |                               |         | A5ACV 210CR       |            |
|---------------|-------------------------------|---------|-------------------|------------|
| SAFETY DEVICE | HIGH PRESSURE SWITCH          | TYPE    |                   | NC         |
|               |                               | OPEN    | Pa / psi          | 4140 / 600 |
|               |                               | CLOSE   | Pa / psi          | 3312 / 480 |
|               | LOW PRESSURE SWITCH           | TYPE    |                   | NC         |
|               |                               | OPEN    | Pa / psi          | 124 / 18   |
|               |                               | CLOSE   | Pa / psi          | 193 / 28   |
|               | PHASE PROTECTION              |         | BUILT IN ON BOARD |            |
|               | DIFFERENTIAL PRESSURE SWITCH  |         | YES               |            |
|               | ANTI-FREEZE PROTECTION SENSOR |         | YES               |            |
|               | DISCH. THERMOSTAT SETTING     | °C / °F | 110 / 230         |            |
|               | OVER PRESSURE RELIEF VALVE    |         | YES               |            |
|               | ANTI-FREEZE HEATER ON BPHE    |         | YES               |            |
|               | PUMP OLP                      |         | YES               |            |
|               | COMPRESSOR OLP                |         | YES               |            |

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## 7. PERFORMANCE DATA

### MODEL : A5ACV 30CR / 55CR - COOLING

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|            |                         | 19                                    |                |                    | 20           |                |                    | 25           |                |                    | 28           |                |                    |                       |                          |                        |                      |
|            |                         | COOL<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|            |                         | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 30CR | 4                       | 9.79                                  | 3.81           | 14.1               | 9.69         | 3.97           | 14.7               | 9.13         | 4.62           | 17.1               | 8.69         | 4.90           | 18.1               | 1.26                  | 82                       | 194                    | 0.9                  |
|            | 5                       | 10.03                                 | 3.84           | 14.2               | 9.94         | 4.01           | 14.8               | 9.36         | 4.67           | 17.2               | 8.91         | 4.95           | 18.3               | 1.30                  | 82                       | 196                    | 0.9                  |
|            | 6                       | 10.27                                 | 3.89           | 14.4               | 10.17        | 4.04           | 14.9               | 9.56         | 4.71           | 17.4               | 9.09         | 4.99           | 18.4               | 1.32                  | 79                       | 197                    | 0.9                  |
|            | 7                       | 10.47                                 | 3.91           | 14.4               | 10.38        | 4.08           | 15.1               | 9.78         | 4.76           | 17.6               | 9.32         | 5.05           | 18.7               | 1.36                  | 76                       | 199                    | 0.9                  |
|            | 8                       | 10.96                                 | 3.97           | 14.7               | 10.84        | 4.14           | 15.3               | 10.14        | 4.81           | 17.8               | 9.61         | 5.09           | 18.8               | 1.39                  | 76                       | 201                    | 0.9                  |
|            | 9                       | 11.29                                 | 4.01           | 14.8               | 11.21        | 4.18           | 15.4               | 10.38        | 4.86           | 17.9               | 9.82         | 5.14           | 19.0               | 1.43                  | 74                       | 203                    | 0.9                  |
|            | 10                      | 11.86                                 | 4.07           | 15.0               | 11.73        | 4.23           | 15.6               | 10.93        | 4.90           | 18.1               | 10.34        | 5.18           | 19.1               | 1.49                  | 73                       | 206                    | 0.9                  |
| A5ACV 55CR | 4                       | 13.09                                 | 4.06           | 8.6                | 12.76        | 4.31           | 9.1                | 11.30        | 5.11           | 10.8               | 10.56        | 5.59           | 11.9               | 1.58                  | 170                      | 211                    | 0.9                  |
|            | 5                       | 15.04                                 | 4.18           | 8.9                | 14.80        | 4.43           | 9.4                | 13.62        | 5.24           | 11.1               | 12.95        | 5.72           | 12.1               | 1.97                  | 155                      | 231                    | 1.0                  |
|            | 6                       | 16.36                                 | 4.29           | 9.1                | 16.21        | 4.54           | 9.6                | 15.37        | 5.35           | 11.3               | 14.80        | 5.83           | 12.4               | 2.28                  | 140                      | 248                    | 1.1                  |
|            | 7                       | 17.99                                 | 4.42           | 9.4                | 17.85        | 4.68           | 9.9                | 17.01        | 5.49           | 11.7               | 16.40        | 5.98           | 12.7               | 2.52                  | 127                      | 260                    | 1.1                  |
|            | 8                       | 18.99                                 | 4.50           | 9.6                | 18.87        | 4.76           | 10.1               | 18.09        | 5.56           | 11.8               | 17.47        | 6.05           | 12.8               | 2.69                  | 118                      | 269                    | 1.2                  |
|            | 9                       | 20.31                                 | 4.61           | 9.8                | 20.12        | 4.86           | 10.3               | 19.05        | 5.67           | 12.0               | 18.28        | 6.16           | 13.1               | 2.78                  | 112                      | 274                    | 1.2                  |
|            | 10                      | 20.99                                 | 4.71           | 10.0               | 20.75        | 4.96           | 10.5               | 19.44        | 5.76           | 12.2               | 18.56        | 6.25           | 13.3               | 2.80                  | 111                      | 275                    | 1.2                  |

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|            |                         | 30                                    |                |                    | 32           |                |                    | 35           |                |                    | 40           |                |                    |                       |                          |                        |                      |
|            |                         | COOL<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|            |                         | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 30CR | 4                       | 8.35                                  | 5.03           | 18.6               | 7.98         | 5.14           | 19.0               | 7.35         | 5.22           | 25.9               | 6.14         | 5.27           | 19.5               | 1.26                  | 82                       | 194                    | 0.9                  |
|            | 5                       | 8.56                                  | 5.09           | 18.8               | 8.17         | 5.19           | 19.2               | 7.53         | 5.27           | 26.1               | 6.29         | 5.31           | 19.6               | 1.30                  | 82                       | 196                    | 0.9                  |
|            | 6                       | 8.73                                  | 5.13           | 19.0               | 8.34         | 5.23           | 19.3               | 7.69         | 5.31           | 26.3               | 6.42         | 5.34           | 19.8               | 1.32                  | 79                       | 197                    | 0.9                  |
|            | 7                       | 8.96                                  | 5.20           | 19.2               | 8.56         | 5.30           | 19.6               | 7.91         | 5.37           | 26.6               | 6.60         | 5.39           | 19.9               | 1.36                  | 76                       | 199                    | 0.9                  |
|            | 8                       | 9.22                                  | 5.23           | 19.3               | 8.79         | 5.32           | 19.7               | 8.09         | 5.39           | 26.7               | 6.75         | 5.42           | 20.0               | 1.39                  | 76                       | 201                    | 0.9                  |
|            | 9                       | 9.45                                  | 5.27           | 19.5               | 8.97         | 5.37           | 19.8               | 8.33         | 5.43           | 26.9               | 6.98         | 5.45           | 20.1               | 1.43                  | 74                       | 203                    | 0.9                  |
|            | 10                      | 9.90                                  | 5.31           | 19.6               | 9.42         | 5.40           | 20.0               | 8.64         | 5.46           | 27.1               | 7.16         | 5.48           | 20.3               | 1.49                  | 73                       | 206                    | 0.9                  |
| A5ACV 55CR | 4                       | 10.11                                 | 5.91           | 12.5               | 9.71         | 6.23           | 13.2               | 9.20         | 6.94           | 14.9               | 8.56         | 7.51           | 15.9               | 1.58                  | 170                      | 211                    | 0.9                  |
|            | 5                       | 12.50                                 | 6.04           | 12.8               | 12.07        | 6.37           | 13.5               | 11.44        | 7.08           | 15.2               | 10.43        | 7.66           | 16.2               | 1.97                  | 155                      | 231                    | 1.0                  |
|            | 6                       | 14.39                                 | 6.15           | 13.1               | 13.96        | 6.48           | 13.7               | 13.26        | 7.18           | 15.5               | 11.98        | 7.77           | 16.5               | 2.28                  | 140                      | 248                    | 1.1                  |
|            | 7                       | 15.95                                 | 6.31           | 13.4               | 15.46        | 6.64           | 14.1               | 14.65        | 7.35           | 15.8               | 13.12        | 7.94           | 16.9               | 2.52                  | 127                      | 260                    | 1.1                  |
|            | 8                       | 17.00                                 | 6.37           | 13.5               | 16.48        | 6.70           | 14.2               | 15.62        | 7.40           | 15.9               | 13.93        | 7.99           | 17.0               | 2.69                  | 118                      | 269                    | 1.2                  |
|            | 9                       | 17.72                                 | 6.48           | 13.8               | 17.13        | 6.81           | 14.5               | 16.15        | 7.51           | 16.2               | 14.34        | 8.10           | 17.2               | 2.78                  | 112                      | 274                    | 1.2                  |
|            | 10                      | 17.94                                 | 6.57           | 13.9               | 17.30        | 6.89           | 14.6               | 16.27        | 7.59           | 16.4               | 14.41        | 8.19           | 17.4               | 2.80                  | 111                      | 275                    | 1.2                  |

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|            |                         | 42                                    |             |                 | 46        |             |                 |                 |                    |                  |                |
|            |                         | COOL CAP.                             | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|            |                         | kW                                    | kW          | A               | kW        | kW          | A               |                 |                    |                  |                |
| A5ACV 30CR | 4                       | 5.28                                  | 5.39        | 19.9            | 3.78      | 5.41        | 20.0            | 1.26            | 82                 | 194              | 0.9            |
|            | 5                       | 5.42                                  | 5.40        | 19.9            | 3.89      | 5.43        | 20.1            | 1.30            | 82                 | 196              | 0.9            |
|            | 6                       | 5.55                                  | 5.42        | 20.0            | 4.01      | 5.45        | 20.1            | 1.32            | 79                 | 197              | 0.9            |
|            | 7                       | 5.71                                  | 5.44        | 20.1            | 4.13      | 5.47        | 20.2            | 1.36            | 76                 | 199              | 0.9            |
|            | 8                       | 5.84                                  | 5.46        | 20.2            | 4.24      | 5.50        | 20.3            | 1.39            | 76                 | 201              | 0.9            |
|            | 9                       | 5.98                                  | 5.47        | 20.2            | 4.36      | 5.52        | 20.4            | 1.43            | 74                 | 203              | 0.9            |
|            | 10                      | 6.20                                  | 5.50        | 20.3            | 4.48      | 5.56        | 20.5            | 1.49            | 73                 | 206              | 0.9            |
| A5ACV 55CR | 4                       | 8.19                                  | 8.31        | 17.6            | 8.15      | 8.34        | 17.7            | 1.58            | 170                | 211              | 0.9            |
|            | 5                       | 9.48                                  | 8.46        | 18.0            | 9.30      | 8.49        | 18.0            | 1.97            | 155                | 231              | 1.0            |
|            | 6                       | 10.55                                 | 8.57        | 18.2            | 10.24     | 8.60        | 18.3            | 2.28            | 140                | 248              | 1.1            |
|            | 7                       | 11.36                                 | 8.76        | 18.6            | 10.98     | 8.79        | 18.7            | 2.52            | 127                | 260              | 1.1            |
|            | 8                       | 11.94                                 | 8.80        | 18.7            | 11.51     | 8.83        | 18.7            | 2.69            | 118                | 269              | 1.2            |
|            | 9                       | 12.28                                 | 8.91        | 18.9            | 11.83     | 8.95        | 19.0            | 2.78            | 112                | 274              | 1.2            |
|            | 10                      | 12.38                                 | 8.99        | 19.1            | 11.95     | 8.96        | 19.0            | 2.80            | 111                | 275              | 1.2            |

## MODEL : A5ACV75CR - COOLING

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|            |                         | 19                                    |             |                 | 20        |             |                 | 25        |             |                 | 28        |             |                 |                 |                    |                  |                |
|            |                         | COOL CAP.                             | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|            |                         | kW                                    | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | m³/hr           | kPa                | W                | A              |
| A5ACV 75CR | 4                       | 22.22                                 | 6.43        | 11.8            | 21.80     | 6.57        | 12.0            | 20.83     | 7.25        | 13.3            | 19.94     | 7.65        | 14.0            | 2.86            | 250                | 706              | 1.2            |
|            | 5                       | 23.07                                 | 6.53        | 12.0            | 22.66     | 6.67        | 12.2            | 21.81     | 7.38        | 13.5            | 20.99     | 7.79        | 14.3            | 3.08            | 238                | 724              | 1.3            |
|            | 6                       | 23.78                                 | 6.63        | 12.2            | 23.38     | 6.77        | 12.4            | 22.62     | 7.50        | 13.7            | 21.87     | 7.92        | 14.5            | 3.27            | 228                | 739              | 1.3            |
|            | 7                       | 24.34                                 | 6.72        | 12.3            | 23.95     | 6.88        | 12.6            | 23.28     | 7.62        | 14.0            | 22.58     | 8.05        | 14.8            | 3.41            | 220                | 750              | 1.3            |
|            | 8                       | 24.76                                 | 6.83        | 12.5            | 24.38     | 6.98        | 12.8            | 23.78     | 7.73        | 14.2            | 23.12     | 8.18        | 15.0            | 3.51            | 213                | 756              | 1.3            |
|            | 9                       | 25.04                                 | 6.93        | 12.7            | 24.67     | 7.08        | 13.0            | 24.12     | 7.85        | 14.4            | 23.48     | 8.30        | 15.2            | 3.58            | 209                | 759              | 1.3            |
|            | 10                      | 25.42                                 | 7.04        | 12.9            | 25.05     | 7.19        | 13.2            | 24.51     | 7.96        | 14.6            | 23.87     | 8.42        | 15.4            | 3.65            | 205                | 762              | 1.3            |

| MODEL      | LEAVING WATER TEMP. (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|------------|--------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|            |                          | 30                                    |                |                    | 32           |                |                    | 35           |                |                    | 40           |                |                    |                       |                          |                        |                      |
|            |                          | COOL<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|            |                          | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 75CR | 4                        | 19.28                                 | 7.92           | 14.5               | 18.55        | 8.18           | 15.0               | 17.35        | 8.58           | 15.7               | 15.06        | 9.22           | 16.9               | 2.86                  | 250                      | 706                    | 1.2                  |
|            | 5                        | 20.39                                 | 8.06           | 14.8               | 19.72        | 8.34           | 15.3               | 18.63        | 8.74           | 16.0               | 16.54        | 9.40           | 17.2               | 3.08                  | 238                      | 724                    | 1.3                  |
|            | 6                        | 21.31                                 | 8.21           | 15.0               | 20.70        | 8.48           | 15.6               | 19.69        | 8.90           | 16.3               | 17.75        | 9.57           | 17.6               | 3.27                  | 228                      | 739                    | 1.3                  |
|            | 7                        | 22.05                                 | 8.34           | 15.3               | 21.48        | 8.63           | 15.8               | 20.52        | 9.05           | 16.6               | 18.67        | 9.74           | 17.9               | 3.41                  | 220                      | 750                    | 1.3                  |
|            | 8                        | 22.61                                 | 8.47           | 15.5               | 22.06        | 8.77           | 16.1               | 21.13        | 9.20           | 16.9               | 19.33        | 9.91           | 18.2               | 3.51                  | 213                      | 756                    | 1.3                  |
|            | 9                        | 22.99                                 | 8.60           | 15.8               | 22.44        | 8.90           | 16.3               | 21.52        | 9.34           | 17.1               | 19.71        | 10.07          | 18.5               | 3.58                  | 209                      | 759                    | 1.3                  |
|            | 10                       | 23.38                                 | 8.73           | 16.0               | 22.83        | 9.03           | 16.6               | 21.91        | 9.48           | 17.4               | 20.11        | 10.22          | 18.7               | 3.65                  | 205                      | 762                    | 1.3                  |

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|            |                         | 42                                    |                |                    | 46           |                |                    |                       |                          |                        |                      |
|            |                         | COOL<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|            |                         | kW                                    | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 75CR | 4                       | 14.04                                 | 9.48           | 17.4               | 11.83        | 9.98           | 18.3               | 2.86                  | 250                      | 706                    | 1.2                  |
|            | 5                       | 15.61                                 | 9.66           | 17.7               | 13.59        | 10.17          | 18.7               | 3.08                  | 238                      | 724                    | 1.3                  |
|            | 6                       | 16.88                                 | 9.84           | 18.0               | 15.00        | 10.36          | 19.0               | 3.27                  | 228                      | 739                    | 1.3                  |
|            | 7                       | 17.85                                 | 10.01          | 18.4               | 16.05        | 10.55          | 19.4               | 3.41                  | 220                      | 750                    | 1.3                  |
|            | 8                       | 18.52                                 | 10.19          | 18.7               | 16.75        | 10.74          | 19.7               | 3.51                  | 213                      | 756                    | 1.3                  |
|            | 9                       | 18.89                                 | 10.35          | 19.0               | 17.09        | 10.92          | 20.0               | 3.58                  | 209                      | 759                    | 1.3                  |
|            | 10                      | 19.30                                 | 10.52          | 19.3               | 17.51        | 11.10          | 20.4               | 3.65                  | 205                      | 762                    | 1.3                  |

## MODEL : A5ACV100 / 135CR - COOLING

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|-------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|             |                         | 19                                    |                |                    | 20           |                |                    | 25           |                |                    | 28           |                |                    |                       |                          |                        |                      |
|             |                         | COOL<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | COOL<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|             |                         | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 100CR | 4                       | 30.76                                 | 8.99           | 18.3               | 30.29        | 9.15           | 18.6               | 27.91        | 9.93           | 20.2               | 26.48        | 10.40          | 21.1               | 3.98                  | 218                      | 951                    | 1.8                  |
|             | 5                       | 31.84                                 | 9.05           | 18.4               | 31.48        | 9.20           | 18.7               | 29.14        | 10.04          | 20.4               | 27.73        | 10.57          | 21.5               | 4.25                  | 203                      | 975                    | 1.9                  |
|             | 6                       | 32.68                                 | 9.09           | 18.5               | 32.33        | 9.26           | 18.8               | 30.00        | 10.16          | 20.7               | 28.60        | 10.72          | 21.8               | 4.40                  | 195                      | 987                    | 1.9                  |
|             | 7                       | 34.00                                 | 9.15           | 18.6               | 33.88        | 9.32           | 18.9               | 31.59        | 10.27          | 20.9               | 30.22        | 10.91          | 22.2               | 4.79                  | 173                      | 1013                   | 1.9                  |
|             | 8                       | 34.36                                 | 9.18           | 18.7               | 34.01        | 9.38           | 19.1               | 31.71        | 10.40          | 21.1               | 30.33        | 11.03          | 22.4               | 4.83                  | 170                      | 1015                   | 2.0                  |
|             | 9                       | 35.20                                 | 9.23           | 18.8               | 34.85        | 9.44           | 19.2               | 32.57        | 10.52          | 21.4               | 31.20        | 11.19          | 22.7               | 4.86                  | 168                      | 1017                   | 2.0                  |
|             | 10                      | 35.80                                 | 9.27           | 18.8               | 35.34        | 9.50           | 19.3               | 33.06        | 10.64          | 21.6               | 31.69        | 11.33          | 23.0               | 4.90                  | 166                      | 1019                   | 2.0                  |
| A5ACV 135CR | 4                       | 42.58                                 | 11.80          | 22.4               | 41.93        | 12.01          | 22.8               | 38.64        | 13.04          | 24.8               | 36.66        | 13.65          | 25.9               | 5.51                  | 203                      | 820                    | 1.8                  |
|             | 5                       | 44.08                                 | 11.87          | 22.5               | 43.58        | 12.08          | 22.9               | 40.34        | 13.18          | 25.0               | 38.39        | 13.87          | 26.3               | 5.89                  | 191                      | 841                    | 1.9                  |
|             | 6                       | 45.24                                 | 11.93          | 22.7               | 44.75        | 12.16          | 23.1               | 41.52        | 13.34          | 25.3               | 39.59        | 14.08          | 26.7               | 6.10                  | 184                      | 853                    | 1.9                  |
|             | 7                       | 47.07                                 | 12.01          | 22.8               | 46.90        | 12.23          | 23.2               | 43.74        | 13.48          | 25.6               | 41.84        | 14.31          | 27.2               | 6.63                  | 165                      | 882                    | 2.0                  |
|             | 8                       | 47.57                                 | 12.05          | 22.9               | 47.08        | 12.31          | 23.4               | 43.90        | 13.65          | 25.9               | 41.99        | 14.48          | 27.5               | 6.68                  | 163                      | 884                    | 2.0                  |
|             | 9                       | 48.73                                 | 12.11          | 23.0               | 48.25        | 12.38          | 23.5               | 45.09        | 13.80          | 26.2               | 43.19        | 14.68          | 27.9               | 6.73                  | 161                      | 887                    | 2.0                  |
|             | 10                      | 49.56                                 | 12.16          | 23.1               | 48.92        | 12.46          | 23.7               | 45.76        | 13.97          | 26.5               | 43.87        | 14.87          | 28.2               | 6.78                  | 159                      | 890                    | 2.0                  |

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 30                                    |             |                 | 32        |             |                 | 35        |             |                 | 40        |             |                 |                 |                    |                  |                |
|             |                         | COOL CAP.                             | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | kW        | kW          | A               |                 |                    |                  |                |
| A5ACV 100CR | 4                       | 25.53                                 | 10.72       | 21.8            | 24.58     | 11.03       | 22.4            | 23.16     | 11.50       | 23.4            | 20.78     | 12.28       | 25.0            | 3.98            | 218                | 951              | 1.8            |
|             | 5                       | 26.79                                 | 10.92       | 22.2            | 25.85     | 11.27       | 22.9            | 24.72     | 11.73       | 23.9            | 22.10     | 12.67       | 25.8            | 4.25            | 203                | 975              | 1.9            |
|             | 6                       | 27.66                                 | 11.10       | 22.6            | 26.73     | 11.47       | 23.3            | 25.61     | 11.98       | 24.4            | 23.00     | 12.97       | 26.4            | 4.40            | 195                | 987              | 1.9            |
|             | 7                       | 29.31                                 | 11.33       | 23.0            | 28.39     | 11.76       | 23.9            | 27.84     | 12.00       | 24.4            | 24.74     | 13.46       | 27.4            | 4.79            | 173                | 1013             | 1.9            |
|             | 8                       | 29.41                                 | 11.46       | 23.3            | 28.49     | 11.88       | 24.1            | 28.06     | 12.49       | 25.4            | 24.81     | 13.57       | 27.6            | 4.83            | 170                | 1015             | 2.0            |
|             | 9                       | 30.29                                 | 11.63       | 23.6            | 29.37     | 12.08       | 24.6            | 28.28     | 12.74       | 25.9            | 25.72     | 13.87       | 28.2            | 4.86            | 168                | 1017             | 2.0            |
|             | 10                      | 30.78                                 | 11.78       | 24.0            | 29.86     | 12.24       | 24.9            | 28.49     | 12.93       | 26.3            | 26.21     | 14.07       | 28.6            | 4.90            | 166                | 1019             | 2.0            |
| A5ACV 135CR | 4                       | 35.35                                 | 14.06       | 26.7            | 34.03     | 14.47       | 27.5            | 32.05     | 15.09       | 28.7            | 28.76     | 16.12       | 30.6            | 5.51            | 203                | 820              | 1.8            |
|             | 5                       | 37.09                                 | 14.33       | 27.2            | 35.79     | 14.79       | 28.1            | 34.22     | 15.40       | 29.3            | 30.59     | 16.64       | 31.6            | 5.89            | 191                | 841              | 1.9            |
|             | 6                       | 38.30                                 | 14.57       | 27.7            | 37.01     | 15.06       | 28.6            | 35.45     | 15.73       | 29.9            | 31.84     | 17.03       | 32.3            | 6.10            | 184                | 853              | 1.9            |
|             | 7                       | 40.57                                 | 14.87       | 28.2            | 39.31     | 15.43       | 29.3            | 38.54     | 15.75       | 30.0            | 34.25     | 17.66       | 33.5            | 6.63            | 165                | 882              | 2.0            |
|             | 8                       | 40.72                                 | 15.04       | 28.6            | 39.44     | 15.59       | 29.6            | 38.84     | 16.39       | 31.2            | 34.35     | 17.81       | 33.8            | 6.68            | 163                | 884              | 2.0            |
|             | 9                       | 41.93                                 | 15.27       | 29.0            | 40.66     | 15.86       | 30.1            | 39.14     | 16.72       | 31.8            | 35.60     | 18.20       | 34.6            | 6.73            | 161                | 887              | 2.0            |
|             | 10                      | 42.60                                 | 15.47       | 29.4            | 41.34     | 16.07       | 30.5            | 39.44     | 16.97       | 32.3            | 36.28     | 18.47       | 35.1            | 6.78            | 159                | 890              | 2.0            |

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 42                                    |             |                 | 46        |             |                 |                 |                    |                  |                |
|             |                         | COOL CAP.                             | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | m³/hr           | kPa                | W                | A              |
| A5ACV 100CR | 4                       | 19.83                                 | 12.59       | 25.6            | 17.93     | 13.22       | 26.9            | 3.98            | 218                | 951              | 1.8            |
|             | 5                       | 21.16                                 | 13.02       | 26.5            | 19.12     | 14.21       | 28.9            | 4.25            | 203                | 975              | 1.9            |
|             | 6                       | 22.07                                 | 13.35       | 27.1            | 20.04     | 14.48       | 29.4            | 4.40            | 195                | 987              | 1.9            |
|             | 7                       | 23.82                                 | 13.88       | 28.2            | 21.51     | 14.97       | 30.4            | 4.79            | 173                | 1013             | 1.9            |
|             | 8                       | 23.89                                 | 13.99       | 28.4            | 21.89     | 15.02       | 30.5            | 4.83            | 170                | 1015             | 2.0            |
|             | 9                       | 24.81                                 | 14.32       | 29.1            | 22.82     | 15.29       | 31.1            | 4.86            | 168                | 1017             | 2.0            |
|             | 10                      | 25.30                                 | 14.53       | 29.5            | 23.47     | 15.45       | 31.4            | 4.90            | 166                | 1019             | 2.0            |
| A5ACV 135CR | 4                       | 27.45                                 | 16.53       | 31.4            | 24.82     | 17.35       | 33.0            | 5.51            | 203                | 820              | 1.8            |
|             | 5                       | 29.29                                 | 17.09       | 32.5            | 26.47     | 18.64       | 35.4            | 5.89            | 191                | 841              | 1.9            |
|             | 6                       | 30.55                                 | 17.52       | 33.3            | 27.75     | 19.00       | 36.1            | 6.10            | 184                | 853              | 1.9            |
|             | 7                       | 32.98                                 | 18.22       | 34.6            | 29.78     | 19.65       | 37.3            | 6.63            | 165                | 882              | 2.0            |
|             | 8                       | 33.08                                 | 18.37       | 34.9            | 30.31     | 19.71       | 37.4            | 6.68            | 163                | 884              | 2.0            |
|             | 9                       | 34.34                                 | 18.79       | 35.7            | 31.59     | 20.07       | 38.1            | 6.73            | 161                | 887              | 2.0            |
|             | 10                      | 35.02                                 | 19.07       | 36.2            | 32.49     | 20.27       | 38.5            | 6.78            | 159                | 890              | 2.0            |

## MODEL : A5ACV 210CR - COOLING

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 19                                    |             |                 | 20        |             |                 | 25        |             |                 | 28        |             |                 |                 |                    |                  |                |
|             |                         | COOL CAP.                             | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
| A5ACV 210CR | 4                       | 63.80                                 | 17.42       | 34.9            | 62.40     | 17.76       | 35.5            | 59.43     | 18.72       | 37.5            | 57.03     | 19.53       | 39.1            | 8.31            | 245                | 1232             | 2.2            |
|             | 5                       | 66.15                                 | 17.43       | 34.9            | 65.03     | 17.78       | 35.6            | 62.45     | 18.74       | 37.5            | 60.19     | 19.66       | 39.4            | 8.80            | 234                | 1259             | 2.3            |
|             | 6                       | 68.03                                 | 17.44       | 34.9            | 67.15     | 17.81       | 35.7            | 64.91     | 18.78       | 37.6            | 62.80     | 19.79       | 39.6            | 9.22            | 225                | 1282             | 2.3            |
|             | 7                       | 70.10                                 | 17.46       | 35.0            | 68.77     | 17.84       | 35.7            | 66.29     | 18.85       | 37.7            | 64.51     | 19.90       | 39.8            | 9.58            | 216                | 1301             | 2.3            |
|             | 8                       | 70.40                                 | 17.49       | 35.0            | 69.87     | 17.88       | 35.8            | 68.18     | 18.95       | 37.9            | 66.38     | 20.00       | 40.0            | 9.86            | 209                | 1317             | 2.4            |
|             | 9                       | 70.89                                 | 17.52       | 35.1            | 70.46     | 17.92       | 35.9            | 68.98     | 19.07       | 38.2            | 67.33     | 20.09       | 40.2            | 10.08           | 203                | 1328             | 2.4            |
|             | 10                      | 70.92                                 | 17.56       | 35.2            | 70.55     | 17.97       | 36.0            | 69.23     | 19.21       | 38.5            | 67.75     | 20.17       | 40.4            | 10.23           | 199                | 1336             | 2.4            |

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 30                                    |             |                 | 32        |             |                 | 35        |             |                 | 40        |             |                 |                 |                    |                  |                |
|             |                         | COOL CAP.                             | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | m³/hr           | kPa                | W                | A              |
| A5ACV 210CR | 4                       | 55.35                                 | 20.11       | 40.3            | 53.61     | 20.72       | 41.5            | 50.87     | 21.70       | 43.4            | 46.01     | 23.51       | 47.1            | 8.31            | 245                | 1232             | 2.2            |
|             | 5                       | 58.53                                 | 20.34       | 40.7            | 56.76     | 20.94       | 41.9            | 53.87     | 21.94       | 43.9            | 48.46     | 23.73       | 47.5            | 8.80            | 234                | 1259             | 2.3            |
|             | 6                       | 61.19                                 | 20.52       | 41.1            | 59.42     | 21.13       | 42.3            | 56.45     | 22.14       | 44.3            | 50.70     | 23.91       | 47.9            | 9.22            | 225                | 1282             | 2.3            |
|             | 7                       | 62.72                                 | 20.67       | 41.4            | 61.12     | 21.28       | 42.6            | 58.62     | 22.30       | 44.6            | 52.41     | 24.06       | 48.2            | 9.58            | 216                | 1301             | 2.3            |
|             | 8                       | 64.92                                 | 20.76       | 41.6            | 63.25     | 21.39       | 42.8            | 60.37     | 22.42       | 44.9            | 54.54     | 24.17       | 48.4            | 9.86            | 209                | 1317             | 2.4            |
|             | 9                       | 65.98                                 | 20.82       | 41.7            | 64.42     | 21.46       | 43.0            | 61.70     | 22.49       | 45.0            | 56.14     | 24.25       | 48.5            | 10.08           | 203                | 1328             | 2.4            |
|             | 10                      | 66.52                                 | 20.83       | 41.7            | 65.10     | 21.50       | 43.0            | 62.62     | 22.52       | 45.1            | 57.54     | 24.29       | 48.6            | 10.23           | 199                | 1336             | 2.4            |

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 42                                    |             |                 | 46        |             |                 |                 |                    |                  |                |
|             |                         | COOL CAP.                             | POWER INPUT | RUNNING CURRENT | COOL CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
| A5ACV 210CR |                         | kW                                    | kW          | A               | kW        | kW          | A               | m³/hr           | kPa                | W                | A              |
|             | 4                       | 43.95                                 | 24.29       | 48.6            | 39.65     | 25.96       | 52.0            | 8.31            | 245                | 1232             | 2.2            |
|             | 5                       | 46.08                                 | 24.48       | 49.0            | 40.97     | 26.05       | 52.1            | 8.80            | 234                | 1259             | 2.3            |
|             | 6                       | 48.11                                 | 24.64       | 49.3            | 42.44     | 26.14       | 52.3            | 9.22            | 225                | 1282             | 2.3            |
|             | 7                       | 49.83                                 | 24.77       | 49.6            | 44.07     | 26.23       | 52.5            | 9.58            | 216                | 1301             | 2.3            |
|             | 8                       | 51.85                                 | 24.88       | 49.8            | 45.85     | 26.33       | 52.7            | 9.86            | 209                | 1317             | 2.4            |
|             | 9                       | 53.56                                 | 24.96       | 50.0            | 47.78     | 26.42       | 52.9            | 10.08           | 203                | 1328             | 2.4            |
|             | 10                      | 55.17                                 | 25.02       | 50.1            | 49.87     | 26.51       | 53.1            | 10.23           | 199                | 1336             | 2.4            |

## MODEL : A5ACV 30 / 55CR - HEATING

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|            |                         | -7                                    |                |                    | -5           |                |                    | 0            |                |                    |                       |                          |                        |                      |
|            |                         | HEAT<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|            |                         | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 30CR | 35                      | 3.82                                  | 3.77           | 14.4               | 5.04         | 3.80           | 14.5               | 7.82         | 3.83           | 14.7               | 1.89                  | 57                       | 227                    | 1.0                  |
|            | 40                      | 2.71                                  | 4.02           | 15.4               | 4.08         | 4.05           | 15.5               | 7.11         | 4.11           | 15.7               | 1.80                  | 61                       | 222                    | 1.0                  |
|            | 45                      | 1.61                                  | 4.42           | 16.9               | 3.03         | 4.45           | 17.0               | 6.20         | 4.50           | 17.2               | 1.66                  | 70                       | 215                    | 0.9                  |
|            | 50                      | 0.66                                  | 4.67           | 17.9               | 2.00         | 4.70           | 18.0               | 5.02         | 4.77           | 18.3               | 1.44                  | 77                       | 204                    | 0.9                  |
|            | 55                      | 0.31                                  | 4.99           | 19.1               | 1.27         | 5.03           | 19.2               | 3.56         | 5.10           | 19.5               | 1.12                  | 93                       | 186                    | 0.8                  |
| A5ACV 55CR | 35                      | 12.55                                 | 4.71           | 10.8               | 13.51        | 4.84           | 11.1               | 15.11        | 5.06           | 11.6               | 2.74                  | 114                      | 272                    | 1.2                  |
|            | 40                      | 12.12                                 | 5.09           | 11.7               | 12.87        | 5.18           | 11.9               | 14.57        | 5.32           | 12.2               | 2.71                  | 116                      | 270                    | 1.2                  |
|            | 45                      | 11.73                                 | 5.35           | 12.3               | 12.47        | 5.51           | 12.6               | 14.16        | 5.80           | 13.3               | 2.64                  | 120                      | 266                    | 1.2                  |
|            | 50                      | 10.05                                 | 5.75           | 13.2               | 10.78        | 5.85           | 13.4               | 12.45        | 6.02           | 13.8               | 2.35                  | 137                      | 251                    | 1.1                  |
|            | 55                      | 7.08                                  | 6.13           | 14.0               | 7.80         | 6.19           | 14.2               | 9.45         | 6.31           | 14.4               | 1.83                  | 161                      | 224                    | 1.0                  |

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|            |                         | 4                                     |                |                    | 7            |                |                    | 10           |                |                    |                       |                          |                        |                      |
|            |                         | HEAT<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|            |                         | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 30CR | 35                      | 9.74                                  | 3.84           | 14.7               | 11.00        | 3.83           | 18.3               | 12.11        | 3.81           | 14.6               | 1.89                  | 57                       | 227                    | 1.0                  |
|            | 40                      | 9.15                                  | 4.14           | 15.8               | 10.44        | 4.14           | 19.7               | 11.54        | 4.14           | 15.8               | 1.80                  | 61                       | 222                    | 1.0                  |
|            | 45                      | 8.32                                  | 4.45           | 17.0               | 9.67         | 4.51           | 21.5               | 10.82        | 4.50           | 17.2               | 1.66                  | 70                       | 215                    | 0.9                  |
|            | 50                      | 7.07                                  | 4.80           | 18.4               | 8.39         | 4.81           | 22.9               | 9.54         | 4.80           | 18.4               | 1.44                  | 77                       | 204                    | 0.9                  |
|            | 55                      | 5.28                                  | 5.12           | 19.6               | 6.50         | 5.13           | 24.4               | 7.66         | 5.12           | 19.6               | 1.12                  | 93                       | 186                    | 0.8                  |
| A5ACV 55CR | 35                      | 15.94                                 | 5.10           | 11.7               | 16.77        | 5.07           | 11.9               | 17.41        | 4.98           | 11.4               | 2.74                  | 114                      | 272                    | 1.2                  |
|            | 40                      | 15.74                                 | 5.34           | 12.2               | 16.50        | 5.31           | 12.5               | 17.17        | 5.25           | 12.0               | 2.71                  | 116                      | 270                    | 1.2                  |
|            | 45                      | 15.34                                 | 5.86           | 13.4               | 16.12        | 5.85           | 13.7               | 16.82        | 5.74           | 13.1               | 2.64                  | 120                      | 266                    | 1.2                  |
|            | 50                      | 13.63                                 | 6.05           | 13.9               | 14.43        | 6.03           | 14.2               | 15.15        | 5.97           | 13.7               | 2.35                  | 137                      | 251                    | 1.1                  |
|            | 55                      | 10.63                                 | 6.33           | 14.5               | 11.43        | 6.32           | 14.8               | 12.15        | 6.28           | 14.4               | 1.83                  | 161                      | 224                    | 1.0                  |

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    | WATER<br>FLOW<br>RATE<br><br>m3/hr | AVAIL.<br>HEAD<br>PRESS.<br><br>kPa | PUMP<br>INPUT<br>POWER<br><br>W | PUMP<br>INPUT<br>AMP<br><br>A |
|------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|------------------------------------|-------------------------------------|---------------------------------|-------------------------------|
|            |                         | 15                                    |                |                    | 21           |                |                    |                                    |                                     |                                 |                               |
|            |                         | HEAT<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                                    |                                     |                                 |                               |
|            |                         | kW                                    | kW             | A                  | kW           | kW             | A                  |                                    |                                     |                                 |                               |
| A5ACV 30CR | 35                      | 13.63                                 | 3.76           | 14.4               | 14.90        | 3.67           | 14.1               | 1.89                               | 57                                  | 227                             | 1.0                           |
|            | 40                      | 12.93                                 | 4.10           | 15.7               | 13.88        | 4.03           | 15.4               | 1.80                               | 61                                  | 222                             | 1.0                           |
|            | 45                      | 12.27                                 | 4.45           | 17.0               | 13.27        | 4.37           | 16.7               | 1.66                               | 70                                  | 215                             | 0.9                           |
|            | 50                      | 11.56                                 | 4.77           | 18.2               | 12.19        | 4.70           | 18.0               | 1.44                               | 77                                  | 204                             | 0.9                           |
|            | 55                      | 9.46                                  | 5.07           | 19.4               | 11.40        | 4.99           | 19.1               | 1.12                               | 93                                  | 186                             | 0.8                           |
| A5ACV 55CR | 35                      | 18.27                                 | 4.70           | 10.8               | 19.14        | 4.15           | 9.5                | 2.74                               | 114                                 | 272                             | 1.2                           |
|            | 40                      | 18.07                                 | 5.05           | 11.6               | 18.79        | 4.66           | 10.7               | 2.71                               | 116                                 | 270                             | 1.2                           |
|            | 45                      | 17.79                                 | 5.42           | 12.4               | 18.65        | 4.80           | 11.0               | 2.64                               | 120                                 | 266                             | 1.2                           |
|            | 50                      | 16.17                                 | 5.77           | 13.2               | 17.11        | 5.36           | 12.3               | 2.35                               | 137                                 | 251                             | 1.1                           |
|            | 55                      | 13.20                                 | 6.15           | 14.1               | 14.17        | 5.89           | 13.5               | 1.83                               | 161                                 | 224                             | 1.0                           |

## MODEL : A5ACV 75CR - HEATING

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|            |                         | -7                                    |             |                 | -5        |             |                 | 0         |             |                 |                 |                    |                  |                |
|            |                         | HEAT CAP.                             | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|            |                         | kW                                    | kW          | A               | kW        | kW          | A               | kW        | kW          | A               |                 |                    |                  |                |
| A5ACV 75CR | 35                      | 14.25                                 | 6.87        | 13.4            | 16.02     | 6.92        | 13.5            | 19.83     | 7.06        | 13.8            | 4.00            | 183                | 748              | 1.4            |
|            | 40                      | 12.74                                 | 7.43        | 14.5            | 14.68     | 7.47        | 14.6            | 18.82     | 7.59        | 14.8            | 3.87            | 191                | 749              | 1.4            |
|            | 45                      | 11.32                                 | 8.02        | 15.6            | 13.36     | 8.05        | 15.7            | 17.70     | 8.17        | 15.9            | 3.71            | 201                | 750              | 1.4            |
|            | 50                      | 10.00                                 | 8.64        | 16.8            | 12.06     | 8.66        | 16.9            | 16.45     | 8.80        | 17.2            | 3.50            | 214                | 751              | 1.3            |
|            | 55                      | 8.75                                  | 9.30        | 18.1            | 10.77     | 9.32        | 18.2            | 15.08     | 9.48        | 18.5            | 3.26            | 228                | 752              | 1.3            |

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|            |                         | 4                                     |                |                    | 7            |                |                    | 10           |                |                    |                       |                          |                        |                      |
|            |                         | HEAT<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|            |                         | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 75CR | 35                      | 22.24                                 | 7.24           | 14.1               | 23.68        | 6.78           | 13.2               | 24.80        | 6.83           | 13.3               | 4.00                  | 183                      | 748                    | 1.4                  |
|            | 40                      | 21.42                                 | 7.78           | 15.2               | 22.95        | 7.31           | 14.3               | 24.11        | 7.38           | 14.4               | 3.87                  | 191                      | 749                    | 1.4                  |
|            | 45                      | 20.40                                 | 8.36           | 16.3               | 21.98        | 7.90           | 15.4               | 23.17        | 7.95           | 15.5               | 3.71                  | 201                      | 750                    | 1.4                  |
|            | 50                      | 19.18                                 | 8.98           | 17.5               | 20.78        | 8.55           | 16.7               | 21.98        | 8.60           | 16.8               | 3.50                  | 214                      | 751                    | 1.3                  |
|            | 55                      | 17.76                                 | 9.63           | 18.8               | 19.34        | 9.26           | 18.1               | 20.53        | 9.28           | 18.1               | 3.26                  | 228                      | 752                    | 1.3                  |

| MODEL      | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|            |                         | 15                                    |             |                 | 21        |             |                 |                 |                    |                  |                |
|            |                         | HEAT CAP.                             | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|            |                         | kW                                    | kW          | A               | kW        | kW          | A               |                 |                    |                  |                |
| A5ACV 75CR | 35                      | 25.44                                 | 6.50        | 12.7            | 26.18     | 5.93        | 11.6            | 4.00            | 183                | 748              | 1.4            |
|            | 40                      | 24.75                                 | 7.07        | 13.8            | 25.31     | 6.54        | 12.8            | 3.87            | 191                | 749              | 1.4            |
|            | 45                      | 23.83                                 | 7.60        | 14.8            | 24.27     | 7.15        | 13.9            | 3.71            | 201                | 750              | 1.4            |
|            | 50                      | 22.65                                 | 8.29        | 16.2            | 23.05     | 7.75        | 15.1            | 3.50            | 214                | 751              | 1.3            |
|            | 55                      | 21.24                                 | 8.94        | 17.4            | 21.66     | 8.34        | 16.3            | 3.26            | 228                | 752              | 1.3            |

## MODEL : A5ACV100 / 135CR - HEATING

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | -7                                    |             |                 | -5        |             |                 | 0         |             |                 |                 |                    |                  |                |
|             |                         | HEAT CAP.                             | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | m3/hr           | kPa                | W                | A              |
| A5ACV 100CR | 35                      | 28.34                                 | 9.48        | 19.8            | 29.27     | 9.52        | 19.9            | 31.59     | 9.64        | 20.2            | 5.81            | 107                | 1049             | 2.0            |
|             | 40                      | 24.46                                 | 10.13       | 21.2            | 25.58     | 10.19       | 21.3            | 28.38     | 10.36       | 21.7            | 5.41            | 134                | 1040             | 2.0            |
|             | 45                      | 20.58                                 | 10.78       | 22.6            | 21.90     | 10.87       | 22.7            | 25.17     | 11.08       | 23.2            | 5.04            | 157                | 1026             | 2.0            |
|             | 50                      | 16.71                                 | 11.44       | 23.9            | 18.21     | 11.54       | 24.1            | 21.96     | 11.80       | 24.7            | 4.64            | 182                | 1003             | 1.9            |
|             | 55                      | 12.83                                 | 12.09       | 25.3            | 14.52     | 12.22       | 25.6            | 18.75     | 12.53       | 26.2            | 4.24            | 204                | 974              | 1.9            |
| A5ACV 135CR | 35                      | 40.10                                 | 13.51       | 26.0            | 41.41     | 13.57       | 26.1            | 44.70     | 13.74       | 26.4            | 8.22            | 97                 | 958              | 2.1            |
|             | 40                      | 34.61                                 | 14.44       | 27.8            | 36.20     | 14.53       | 28.0            | 40.16     | 14.77       | 28.4            | 7.65            | 123                | 933              | 2.0            |
|             | 45                      | 29.12                                 | 15.37       | 29.6            | 30.98     | 15.49       | 29.8            | 35.62     | 15.80       | 30.4            | 7.13            | 145                | 907              | 2.0            |
|             | 50                      | 23.64                                 | 16.30       | 31.4            | 25.76     | 16.45       | 31.7            | 31.08     | 16.83       | 32.4            | 6.56            | 168                | 878              | 1.9            |
|             | 55                      | 18.15                                 | 17.24       | 33.2            | 20.55     | 17.41       | 33.5            | 26.53     | 17.86       | 34.4            | 6.01            | 187                | 848              | 1.6            |

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |                |                    |              |                |                    |              |                |                    | WATER<br>FLOW<br>RATE | AVAIL.<br>HEAD<br>PRESS. | PUMP<br>INPUT<br>POWER | PUMP<br>INPUT<br>AMP |
|-------------|-------------------------|---------------------------------------|----------------|--------------------|--------------|----------------|--------------------|--------------|----------------|--------------------|-----------------------|--------------------------|------------------------|----------------------|
|             |                         | 4                                     |                |                    | 7            |                |                    | 10           |                |                    |                       |                          |                        |                      |
|             |                         | HEAT<br>CAP.                          | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT | HEAT<br>CAP. | POWER<br>INPUT | RUNNING<br>CURRENT |                       |                          |                        |                      |
|             |                         | kW                                    | kW             | A                  | kW           | kW             | A                  | kW           | kW             | A                  |                       |                          |                        |                      |
| A5ACV 100CR | 35                      | 32.72                                 | 9.73           | 20.3               | 33.77        | 9.84           | 20.6               | 36.69        | 9.88           | 20.7               | 5.81                  | 107                      | 1049                   | 2.0                  |
|             | 40                      | 29.00                                 | 10.49          | 21.9               | 31.45        | 10.62          | 22.2               | 34.29        | 10.64          | 22.2               | 5.41                  | 134                      | 1040                   | 2.0                  |
|             | 45                      | 27.80                                 | 11.25          | 23.5               | 29.31        | 11.40          | 23.8               | 31.47        | 11.47          | 24.0               | 5.04                  | 157                      | 1026                   | 2.0                  |
|             | 50                      | 24.64                                 | 12.01          | 25.1               | 26.97        | 12.18          | 25.5               | 29.48        | 12.31          | 25.8               | 4.64                  | 182                      | 1003                   | 1.9                  |
|             | 55                      | 22.14                                 | 12.78          | 26.7               | 24.68        | 12.96          | 27.1               | 27.08        | 13.15          | 27.5               | 4.24                  | 204                      | 974                    | 1.9                  |
| A5ACV 135CR | 35                      | 46.29                                 | 13.87          | 26.7               | 47.78        | 14.02          | 26.8               | 51.91        | 14.08          | 27.1               | 8.22                  | 97                       | 958                    | 2.1                  |
|             | 40                      | 41.03                                 | 14.95          | 28.8               | 44.50        | 15.14          | 28.9               | 48.51        | 15.16          | 29.2               | 7.65                  | 123                      | 933                    | 2.0                  |
|             | 45                      | 39.33                                 | 16.04          | 30.9               | 41.47        | 16.25          | 31.1               | 44.53        | 16.36          | 31.5               | 7.13                  | 145                      | 907                    | 2.0                  |
|             | 50                      | 34.87                                 | 17.13          | 33.0               | 38.16        | 17.36          | 33.2               | 41.71        | 17.55          | 33.8               | 6.56                  | 168                      | 878                    | 1.9                  |
|             | 55                      | 31.32                                 | 18.21          | 35.0               | 34.92        | 18.48          | 35.3               | 38.32        | 18.75          | 36.1               | 6.01                  | 187                      | 848                    | 1.6                  |

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 15                                    |             |                 | 21        |             |                 |                 |                    |                  |                |
|             |                         | HEAT CAP.                             | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | m3/hr           | kPa                | W                | A              |
| A5ACV 100CR | 35                      | 42.37                                 | 10.00       | 20.9            | 47.99     | 10.09       | 21.1            | 5.81            | 107                | 1049             | 2.0            |
|             | 40                      | 39.62                                 | 10.87       | 22.7            | 44.91     | 11.01       | 23.0            | 5.41            | 134                | 1040             | 2.0            |
|             | 45                      | 36.71                                 | 11.73       | 24.5            | 41.84     | 11.93       | 25.0            | 5.04            | 157                | 1026             | 2.0            |
|             | 50                      | 34.14                                 | 12.60       | 26.4            | 38.76     | 12.85       | 26.9            | 4.64            | 182                | 1003             | 1.9            |
|             | 55                      | 31.39                                 | 13.46       | 28.2            | 36.53     | 13.77       | 28.8            | 4.24            | 204                | 974              | 1.9            |
| A5ACV 135CR | 35                      | 59.94                                 | 14.26       | 27.4            | 67.90     | 14.39       | 27.7            | 8.22            | 97                 | 958              | 2.1            |
|             | 40                      | 56.06                                 | 15.49       | 29.8            | 63.55     | 15.70       | 30.2            | 7.65            | 123                | 933              | 2.0            |
|             | 45                      | 51.94                                 | 16.72       | 32.2            | 59.19     | 17.07       | 32.9            | 7.13            | 145                | 907              | 2.0            |
|             | 50                      | 48.30                                 | 17.96       | 34.6            | 54.84     | 18.32       | 35.3            | 6.56            | 168                | 878              | 1.9            |
|             | 55                      | 44.42                                 | 19.19       | 36.9            | 51.69     | 19.72       | 38.0            | 6.01            | 187                | 848              | 1.6            |

## MODEL : A5ACV 210CR - HEATING

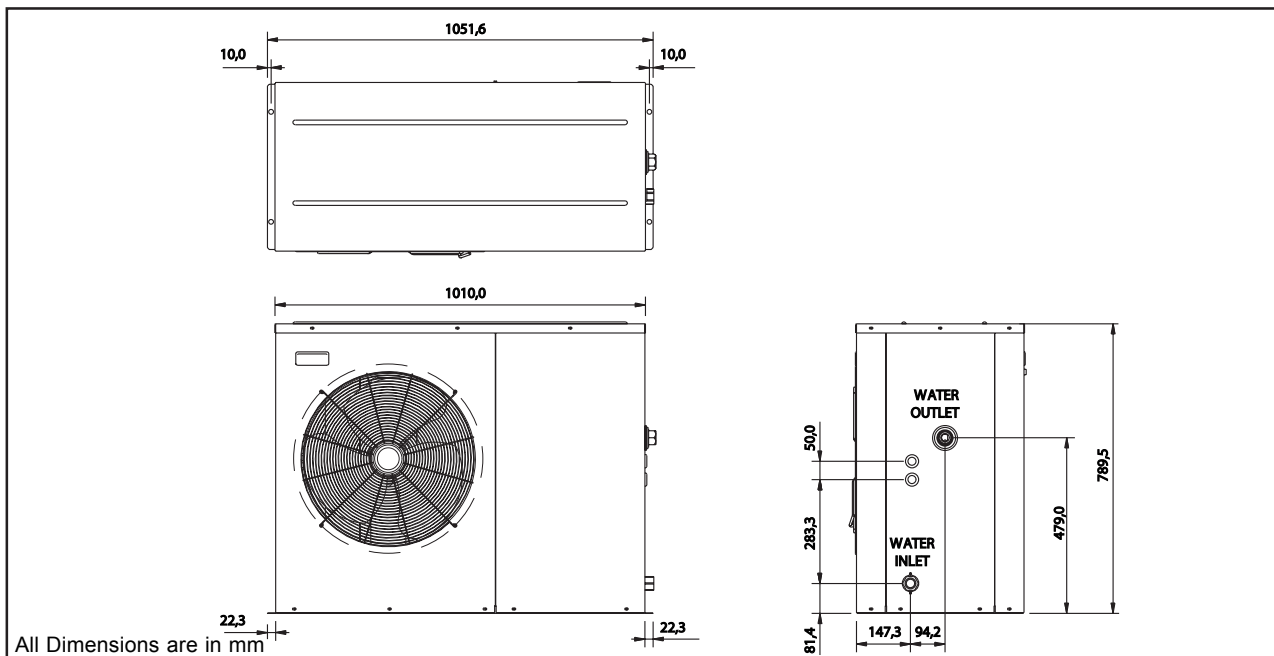
| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | -7                                    |             |                 | -5        |             |                 | 0         |             |                 |                 |                    |                  |                |
|             |                         | HEAT CAP.                             | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | m3/hr           | kPa                | W                | A              |
| A5ACV 210CR | 35                      | 46.14                                 | 18.00       | 36.8            | 46.75     | 18.01       | 36.8            | 54.77     | 18.12       | 37.0            | 10.75           | 185                | 1363             | 2.5            |
|             | 40                      | 45.01                                 | 19.54       | 40.0            | 45.84     | 19.55       | 40.0            | 53.59     | 19.64       | 40.2            | 10.50           | 192                | 1350             | 2.4            |
|             | 45                      | 43.87                                 | 21.30       | 43.6            | 44.88     | 21.31       | 43.6            | 52.51     | 21.43       | 43.8            | 10.30           | 197                | 1340             | 2.4            |
|             | 50                      | 42.07                                 | 23.24       | 47.5            | 43.16     | 23.27       | 47.6            | 51.19     | 23.50       | 48.0            | 10.12           | 202                | 1330             | 2.4            |
|             | 55                      | 39.76                                 | 25.42       | 52.0            | 40.93     | 25.47       | 52.1            | 49.62     | 25.82       | 52.8            | 10.01           | 205                | 1324             | 2.4            |

| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 4                                     |             |                 | 7         |             |                 | 10        |             |                 |                 |                    |                  |                |
|             |                         | HEAT CAP.                             | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | kW        | kW          | A               | m3/hr           | kPa                | W                | A              |
| A5ACV 210CR | 35                      | 59.69                                 | 18.30       | 37.4            | 64.26     | 18.48       | 37.8            | 67.08     | 18.72       | 38.3            | 10.75           | 185                | 1363             | 2.5            |
|             | 40                      | 58.48                                 | 19.79       | 40.4            | 62.73     | 19.93       | 40.8            | 65.83     | 20.12       | 41.1            | 10.50           | 192                | 1350             | 2.4            |
|             | 45                      | 57.44                                 | 21.59       | 44.1            | 61.55     | 21.80       | 44.6            | 64.84     | 21.93       | 44.8            | 10.30           | 197                | 1340             | 2.4            |
|             | 50                      | 56.40                                 | 23.76       | 48.6            | 60.48     | 23.87       | 48.8            | 64.22     | 24.06       | 49.2            | 10.12           | 202                | 1330             | 2.4            |
|             | 55                      | 55.26                                 | 26.12       | 53.4            | 59.82     | 26.37       | 53.9            | 63.71     | 26.64       | 54.5            | 10.01           | 205                | 1324             | 2.4            |

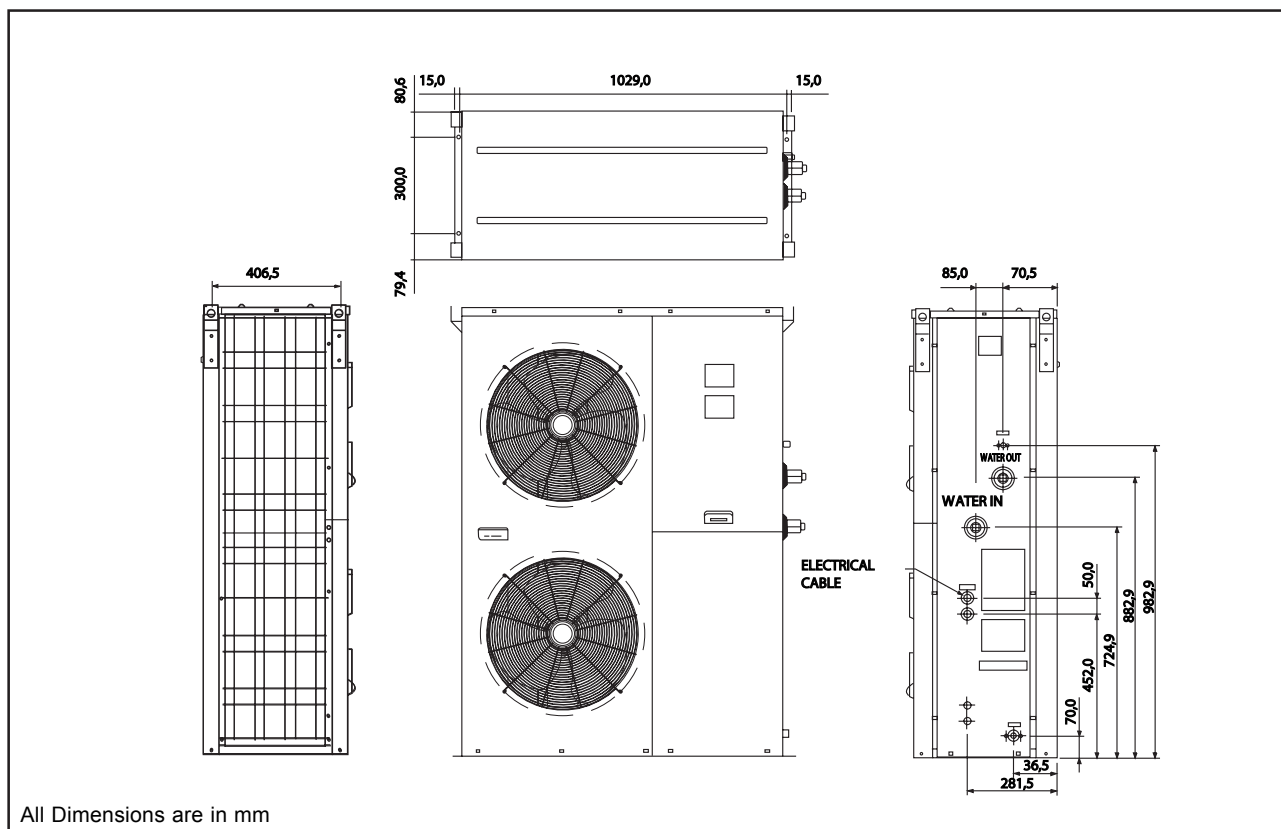
| MODEL       | LEAVING WATER TEMP (°C) | AMBIENT TEMPERATURE ON CONDENSOR (°C) |             |                 |           |             |                 | WATER FLOW RATE | AVAIL. HEAD PRESS. | PUMP INPUT POWER | PUMP INPUT AMP |
|-------------|-------------------------|---------------------------------------|-------------|-----------------|-----------|-------------|-----------------|-----------------|--------------------|------------------|----------------|
|             |                         | 15                                    |             |                 | 21        |             |                 |                 |                    |                  |                |
|             |                         | HEAT CAP.                             | POWER INPUT | RUNNING CURRENT | HEAT CAP. | POWER INPUT | RUNNING CURRENT |                 |                    |                  |                |
|             |                         | kW                                    | kW          | A               | kW        | kW          | A               | m3/hr           | kPa                | W                | A              |
| A5ACV 210CR | 35                      | 72.36                                 | 19.21       | 39.3            | 83.37     | 20.82       | 42.6            | 10.75           | 185                | 1363             | 2.5            |
|             | 40                      | 70.88                                 | 20.50       | 41.9            | 81.98     | 22.03       | 45.0            | 10.50           | 192                | 1350             | 2.4            |
|             | 45                      | 69.72                                 | 24.43       | 49.9            | 81.04     | 23.97       | 49.0            | 10.30           | 197                | 1340             | 2.4            |
|             | 50                      | 69.72                                 | 24.43       | 49.9            | 80.82     | 26.10       | 53.4            | 10.12           | 202                | 1330             | 2.4            |
|             | 55                      | 69.00                                 | 27.16       | 55.5            | 29.14     | 29.14       | 59.6            | 10.01           | 205                | 1324             | 2.4            |

## 8. DIMENSIONAL DATA

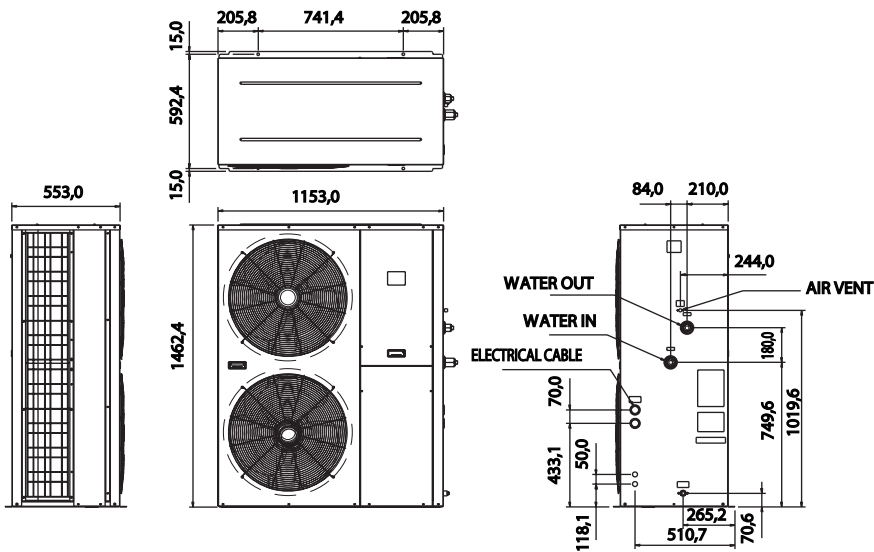
**MODEL : A5ACV 30CR**



**MODEL : A5ACV 55CR**

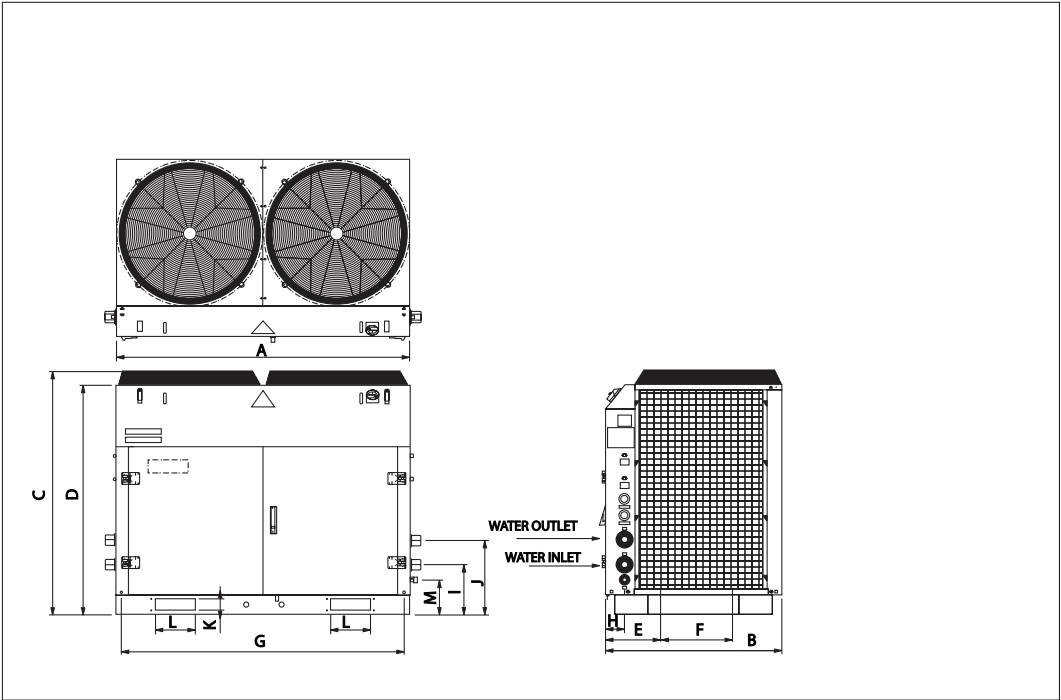


**MODEL : A5ACV 75CR**



All Dimensions are in mm

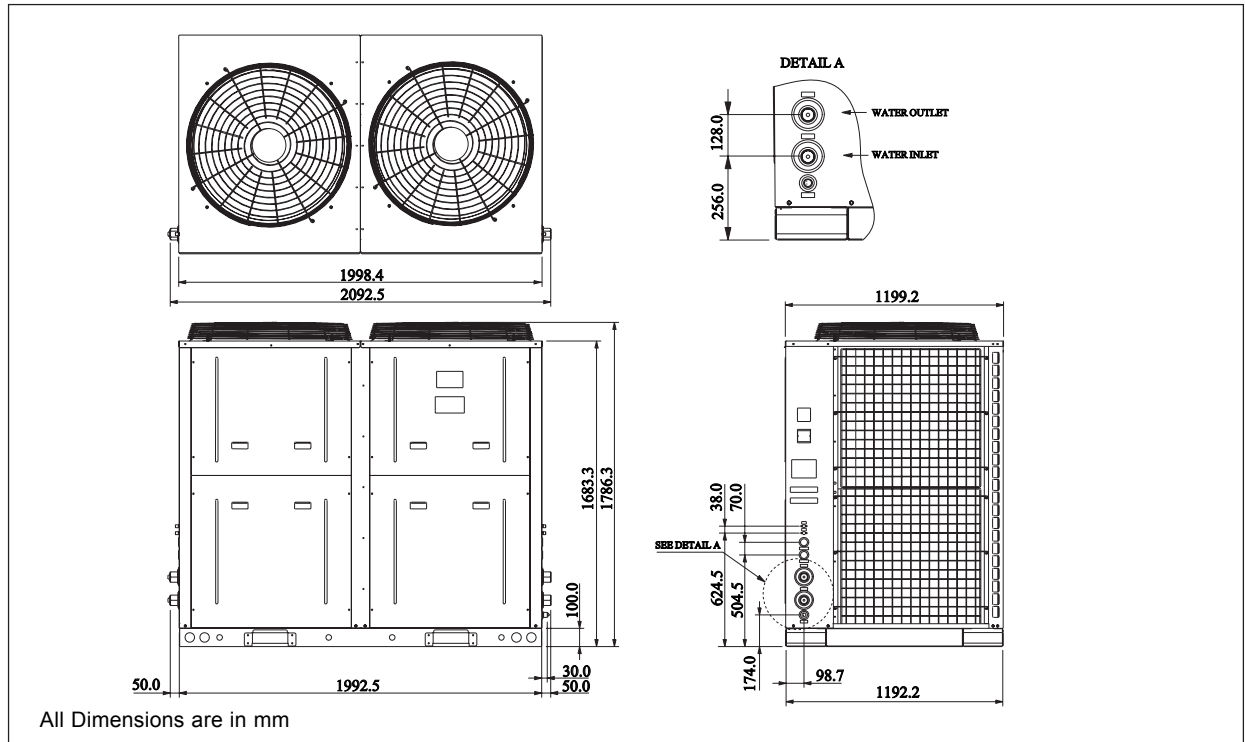
MODEL : A5ACV100 / 135CR



All Dimensions are in mm

| Model      | A    | B    | C    | D    | E     | F             | G    |
|------------|------|------|------|------|-------|---------------|------|
|            |      |      |      |      |       | Base Leg Hole |      |
| A5ACV100CR | 1500 | 900  | 1245 | 1190 | 297.5 | 307.5         | 1446 |
| A5ACV135CR | 1800 | 1150 | 1245 | 1190 | 347.5 | 416           | 1766 |

| Model      | H   | I   | J   | K  | L   | M   |
|------------|-----|-----|-----|----|-----|-----|
| A5ACV100CR | 100 | 265 | 385 | 60 | 200 | 170 |
| A5ACV135CR | 10  | 265 | 385 | 60 | 200 | 170 |



All Dimensions are in mm

## 9. ELECTRICAL DATA

### ELECTRICAL DATA - HEAT PUMP R410A INVERTER

| MODEL               |                                 |         | A5ACV30CR          | A5ACV55CR          |
|---------------------|---------------------------------|---------|--------------------|--------------------|
| CONDENSER FAN MOTOR | INSULATION GRADE                |         | F                  | F                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 220 - 240 / 1 / 50 |                    |
|                     | RATED INPUT POWER               | W       | 135                | 270                |
|                     | RATED RUNNING CURRENT           | A       | 0.6                | 1.3                |
|                     | MOTOR OUTPUT                    | W       | -                  | -                  |
|                     | POLES                           |         | 6                  | 6                  |
| COMPRESSOR          | INSULATION GRADE                |         | E                  | F                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 220 - 240 / 1 / 50 | 380 - 415 / 3 / 50 |
|                     | CAPACITOR                       | F       | NA                 | NA                 |
|                     | RATED INPUT POWER (COOLING)     | W       | 4945               | 6630               |
|                     | RATED INPUT POWER (HEATING)     | W       | 4077               | 5130               |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 18.3               | 13.5               |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 15.7               | 11.4               |
|                     | LOCKED ROTOR AMP.               | A       | NA                 | NA                 |
| WATER PUMP          | INSULATION GRADE                |         | F                  | F                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 220 - 240 / 1 / 50 | 380 - 415 / 3 / 50 |
|                     | RATED INPUT POWER (COOLING)     | W       | 199                | 700                |
|                     | RATED INPUT POWER (HEATING)     | W       | 206                | 700                |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 0.9                | 1.3                |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 0.9                | 1.3                |

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151.

| MODEL               |                                 |         | A5ACV75CR          |
|---------------------|---------------------------------|---------|--------------------|
| CONDENSER FAN MOTOR | INSULATION GRADE                |         | B                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 220 - 240 / 1 / 50 |
|                     | RATED INPUT POWER               | W       | 300 x2             |
|                     | RATED RUNNING CURRENT           | A       | 1.5 x2             |
|                     | MOTOR OUTPUT                    | W       | 145 x2             |
|                     | POLES                           |         | 8                  |
| COMPRESSOR          | INSULATION GRADE                |         | E                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 380 - 415 / 3 / 50 |
|                     | CAPACITOR                       | F       | NA                 |
|                     | RATED INPUT POWER (COOLING)     | W       | 7700               |
|                     | RATED INPUT POWER (HEATING)     | W       | 6500               |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 14.3               |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 13.1               |
|                     | LOCKED ROTOR AMP.               | A       | NA                 |
| WATER PUMP          | INSULATION GRADE                |         | F                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 380 - 415 / 3 / 50 |
|                     | RATED INPUT POWER (COOLING)     | W       | 750                |
|                     | RATED INPUT POWER (HEATING)     | W       | 800                |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 1.3                |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 1.4                |

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151.

## ELECTRICAL DATA - HEAT PUMP R410A INVERTER

| MODEL               |                                 |         | A5ACV100CR         | A5ACV135CR |
|---------------------|---------------------------------|---------|--------------------|------------|
| CONDENSER FAN MOTOR | INSULATION GRADE                |         | F                  | F          |
|                     | POWER SOURCE                    | V/Ph/Hz | 220 - 240 / 1 / 50 |            |
|                     | RATED INPUT POWER               | W       | 500                | 1430       |
|                     | RATED RUNNING CURRENT           | A       | 2.2                | 6.0        |
|                     | MOTOR OUTPUT                    | W       | 200 x2             | 450 x2     |
|                     | POLES                           |         | 8                  | 6          |
| COMPRESSOR          | INSULATION GRADE                |         | NA                 | NA         |
|                     | POWER SOURCE                    | V/Ph/Hz | 380 - 415 / 3 / 50 |            |
|                     | CAPACITOR                       | μF      | NA                 | NA         |
|                     | RATED INPUT POWER (COOLING)     | W       | 10500              | 13520      |
|                     | RATED INPUT POWER (HEATING)     | W       | 9900               | 14020      |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 21.9               | 25.9       |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 21.3               | 27.0       |
|                     | LOCKED ROTOR AMP.               | A       | 67 / -             | 111 / -    |
| WATER PUMP          | INSULATION GRADE                |         | F                  | F          |
|                     | POWER SOURCE                    | V/Ph/Hz | 380 - 415 / 3 / 50 |            |
|                     | RATED INPUT POWER (COOLING)     | W       | 1013               | 882        |
|                     | RATED INPUT POWER (HEATING)     | W       | 1026               | 907        |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 2.0                | 2.0        |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 2.0                | 2.0        |

- 1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.  
2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151.

## ELECTRICAL DATA - HEAT PUMP R410A INVERTER

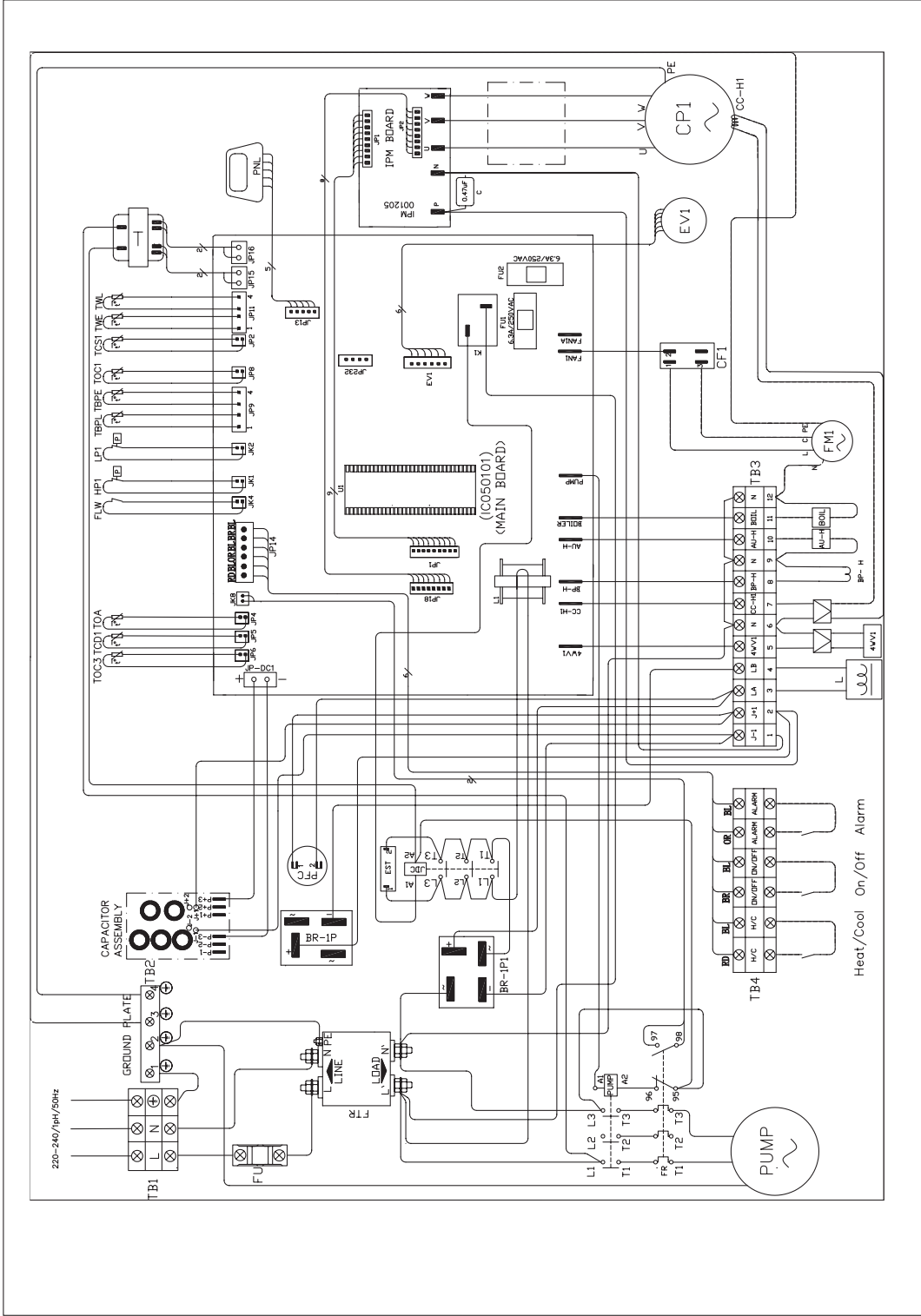
| MODEL               |                                 |         | A5ACV210CR         |
|---------------------|---------------------------------|---------|--------------------|
| CONDENSER FAN MOTOR | INSULATION GRADE                |         | B                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 220 - 240 / 1 / 50 |
|                     | RATED INPUT POWER               | W       | 820 x2             |
|                     | RATED RUNNING CURRENT           | A       | 3.6 x2             |
|                     | MOTOR OUTPUT                    | W       | 550 x2             |
|                     | POLES                           |         | 8                  |
| COMPRESSOR          | INSULATION GRADE                |         | E                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 380 - 415 / 3 / 50 |
|                     | CAPACITOR                       | μF      | NA                 |
|                     | RATED INPUT POWER (COOLING)     | W       | 20200              |
|                     | RATED INPUT POWER (HEATING)     | W       | 19700              |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 38.7               |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 38.7               |
|                     | LOCKED ROTOR AMP.               | A       | 118                |
| WATER PUMP          | INSULATION GRADE                |         | F                  |
|                     | POWER SOURCE                    | V/Ph/Hz | 380 - 415 / 3 / 50 |
|                     | RATED INPUT POWER (COOLING)     | W       | 1300               |
|                     | RATED INPUT POWER (HEATING)     | W       | 1300               |
|                     | RATED RUNNING CURRENT (COOLING) | A       | 2.3                |
|                     | RATED RUNNING CURRENT (HEATING) | A       | 2.3                |

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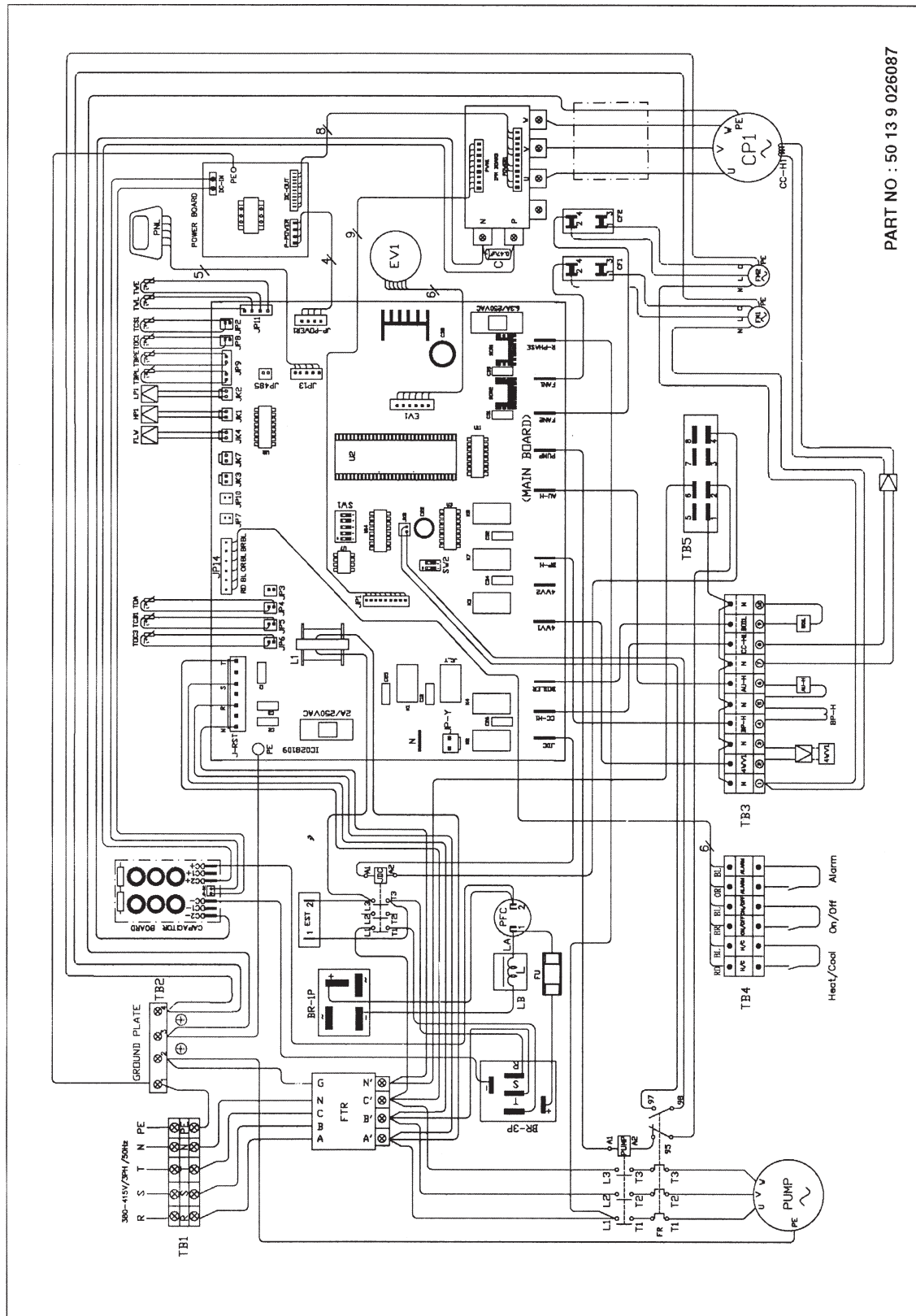
2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151.

## 10. WIRING DIAGRAMS

**MODEL : A5ACV 30CR**

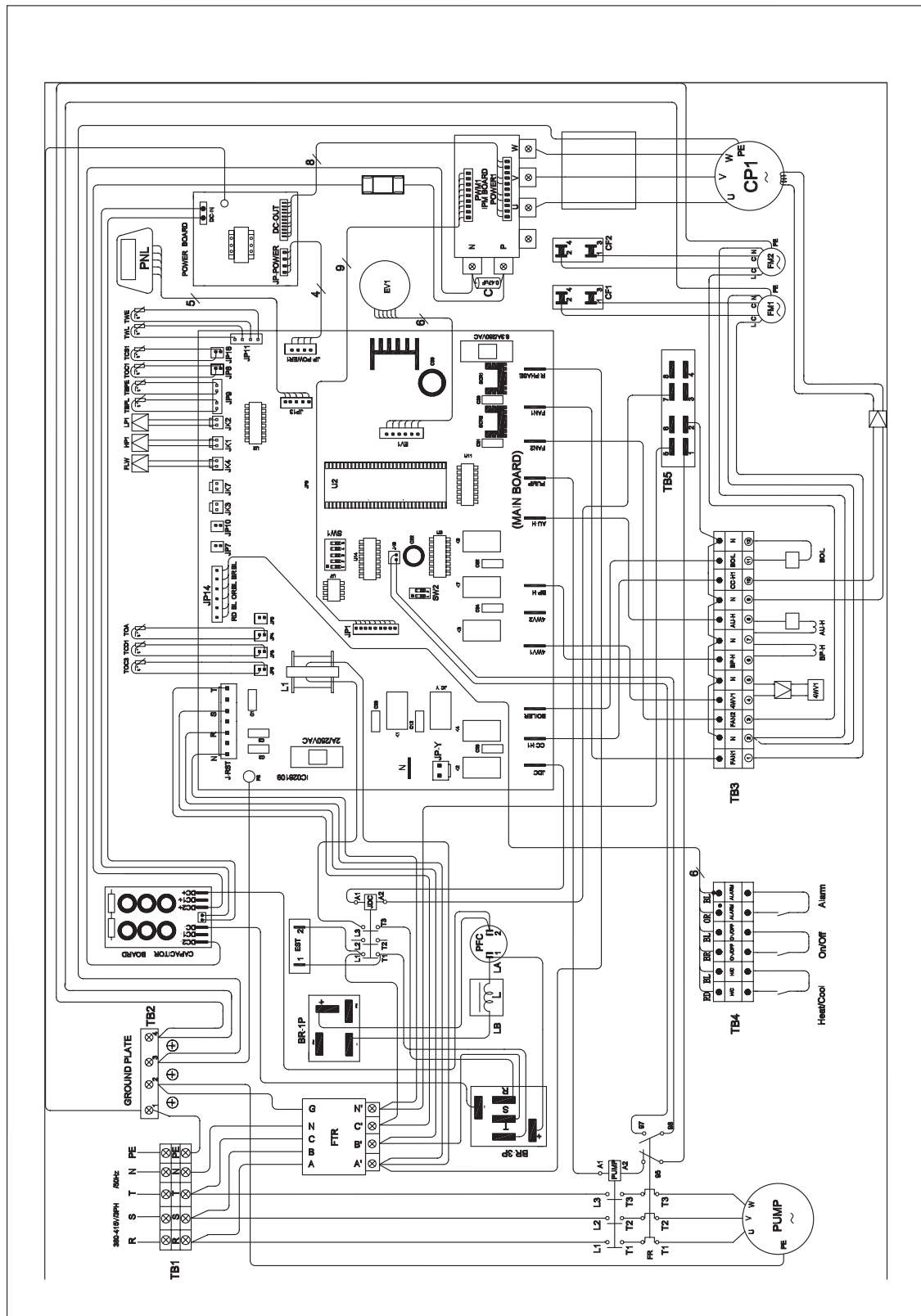


# MODEL : A5ACV 55CR

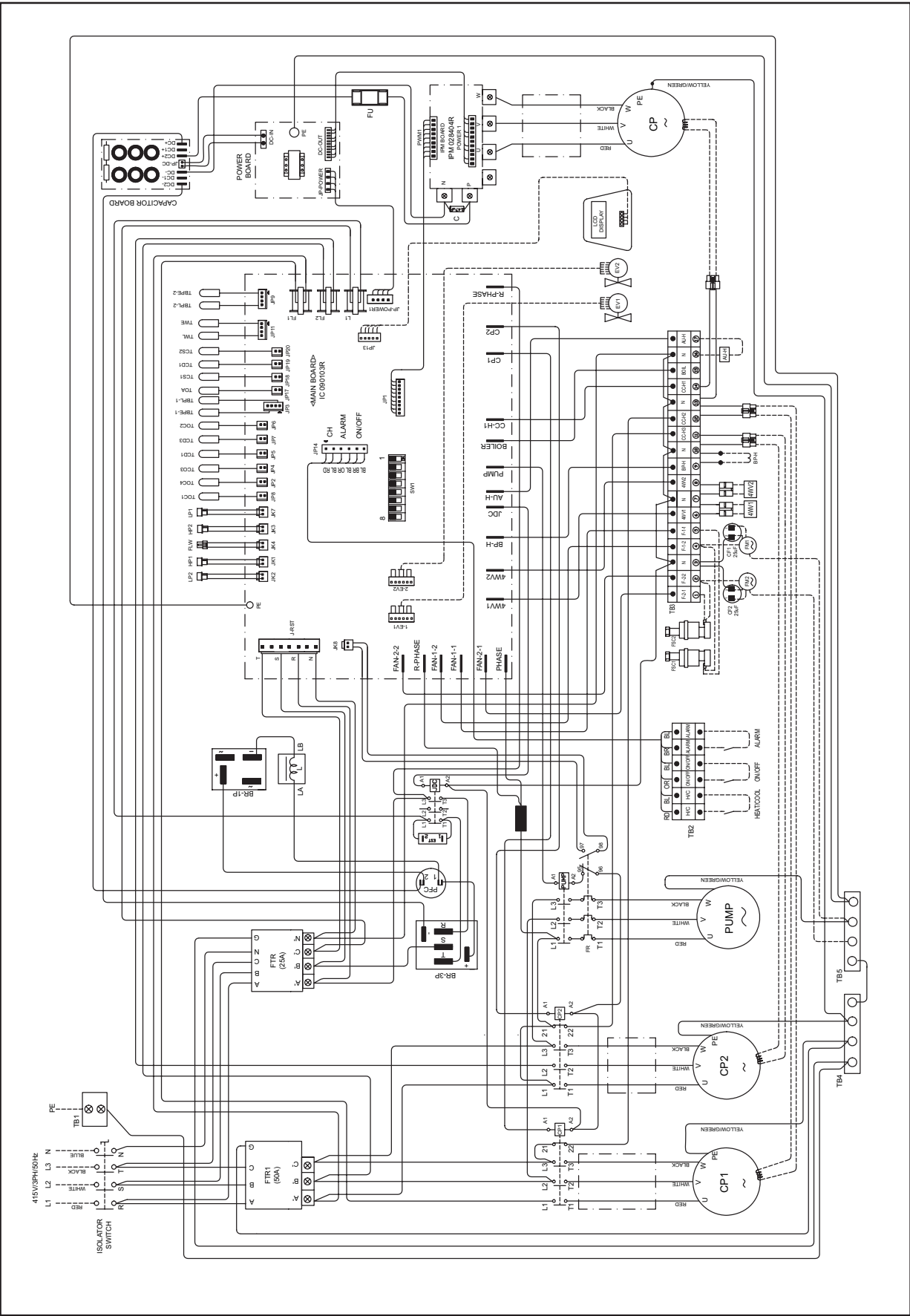


PART NO : 50 13 9 026087

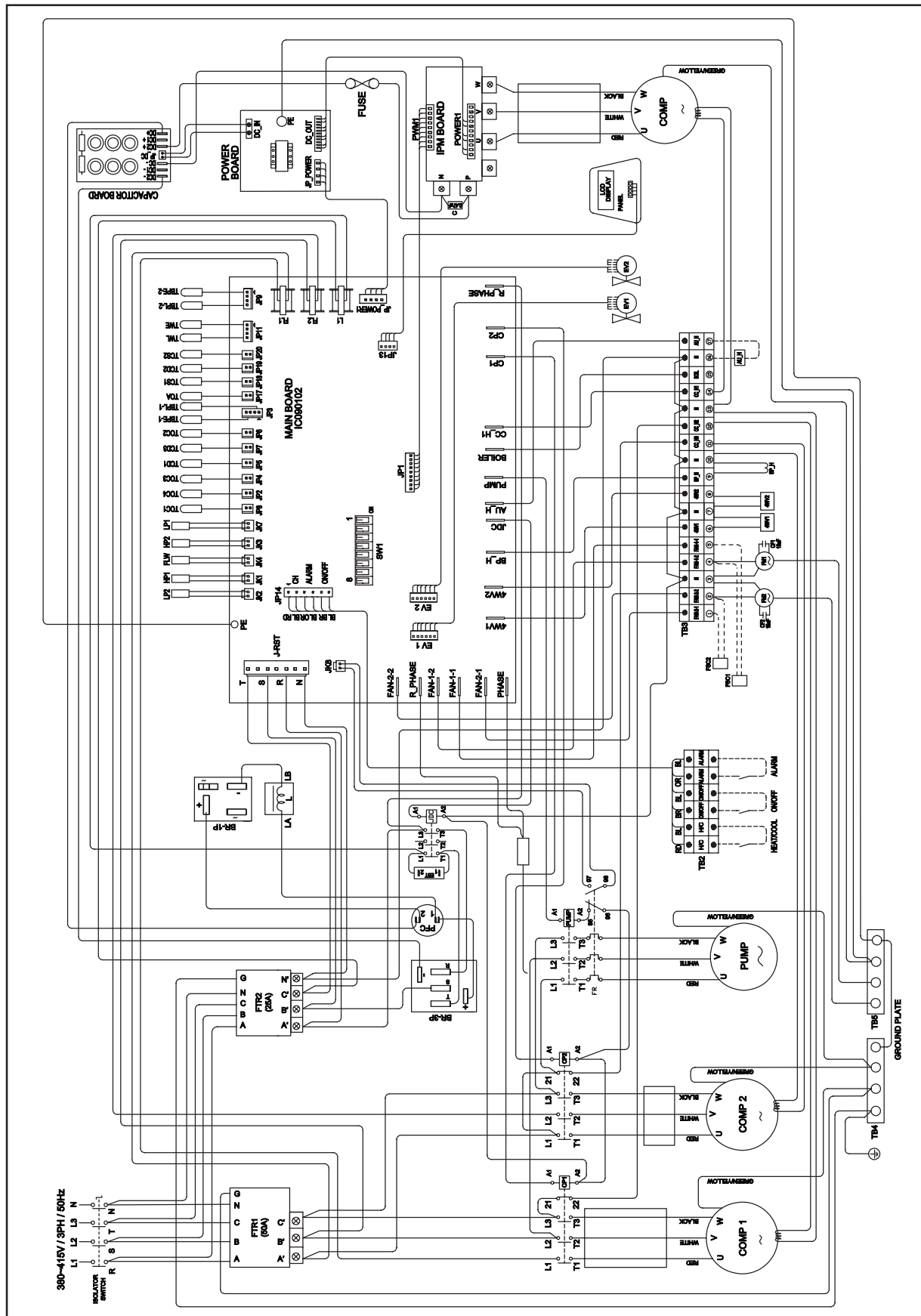
**MODEL : A5ACV 75CR**



MODEL : A5ACV 100/135CR



# MODEL : A5ACV 210CR



## 12. SERVICING AND MAINTENANCE

### SERVICING

Servicing or maintenance of these unit must be carried out by experienced personnel with specific training in refrigeration. Repeated check the safety devices and continuous cycling of control components must be analyzed and corrected before being reset.

The simple design of the refrigeration circuit totally eliminates potential problems during normal unit operation. No maintenance work is needed on the refrigeration circuit as long as the unit is operating normally.

Ease of maintenance has been taken into consideration during the design stage such that the unit is easily accessible for servicing and maintenance. By accessing from the front panel of the unit, servicing and maintenance operation can be done easily. The electrical components are especially easy to access since it is located in the terminal box on top of the front panel.

Under normal circumstances, these chiller require only a check and cleaning of air intake through the coil surface only. These can be done monthly or quarterly depending on the surrounding where the units are installed.

When the surrounding is very oily or dusty, then the coils must be regularly cleaned by a qualified air conditioner service technician to ensure sufficient cooling capacity and efficient unit operation. The normal life span might be shortened if no proper service is provided.

For consistent performance and durability, always conduct proper and regular maintenance to the unit.

For prolong period of operation time, the heat exchanger will become dirty impairing its effectiveness and reducing the performance of the units. Consult your local dealer about the cleaning of the heat exchanger.

No major maintenance or servicing needed for the internal water circuit in the unit except the water pump failure. It is advised that regular check on the stainer to be conducted and change the water stainer if it is dirty or choked.

Always check the water level in the system, in order to protect the moving components in the hydraulic kit from over heating and excessive wear.

## 13. TROUBLESHOOTING

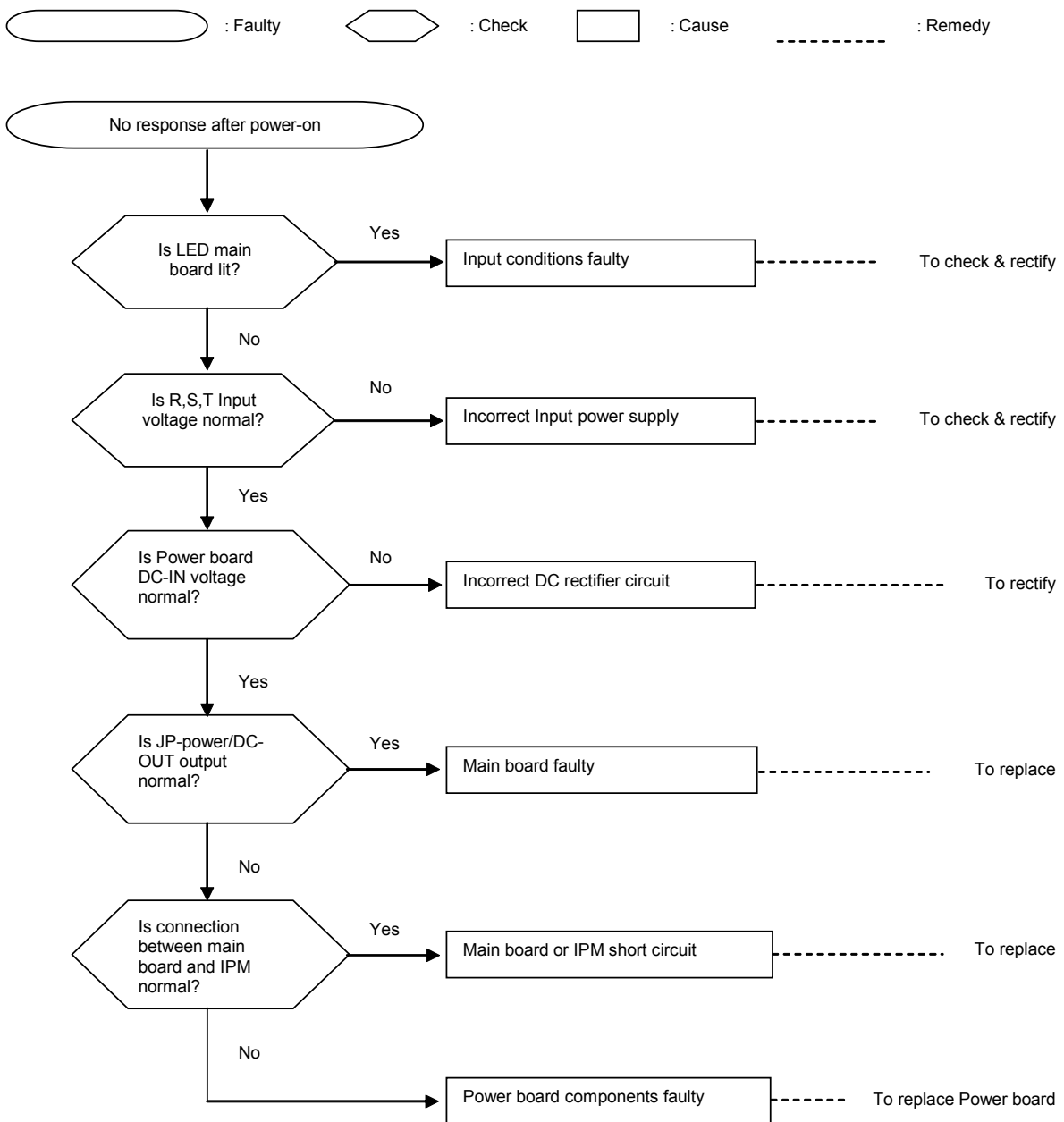
When a malfunction of the unit is detected, immediately switch off the main power supply before proceeding with the following troubleshooting procedures.

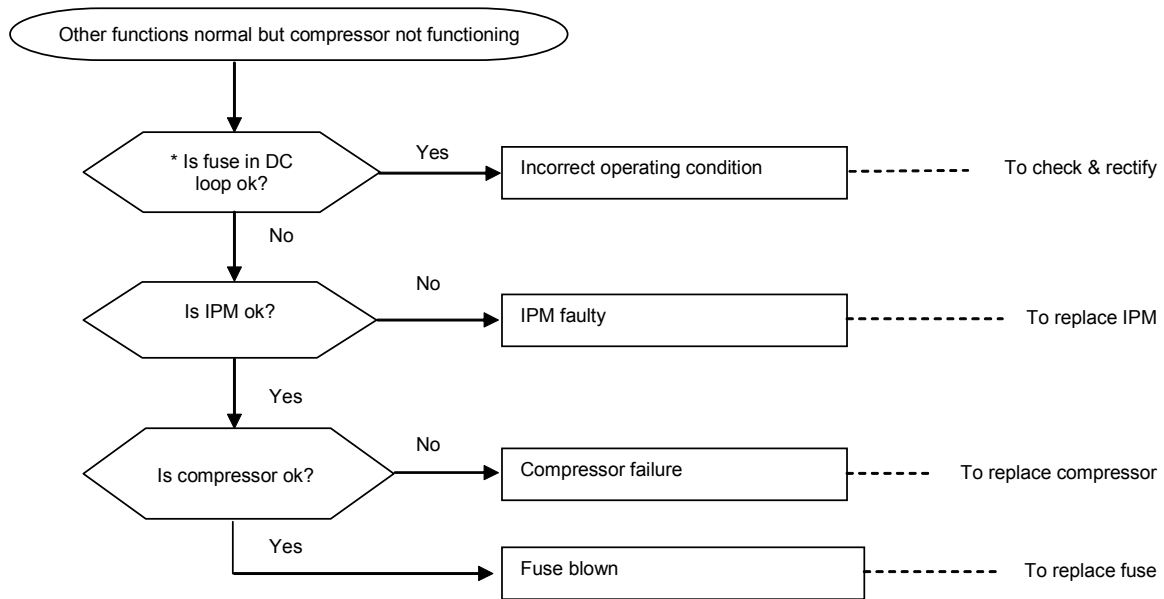
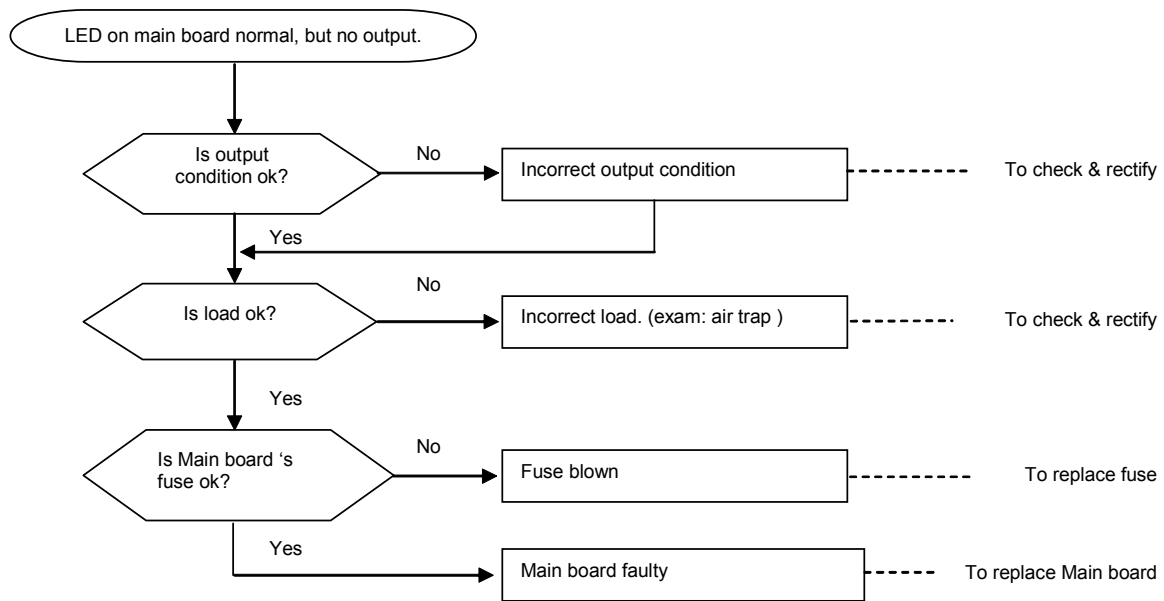
The following are common fault conditions and simple troubleshooting tips. If any other fault conditions that are not listed occur, contact your nearest local dealer. DO NOT attempt to troubleshoot the unit by yourself.

### Error Code

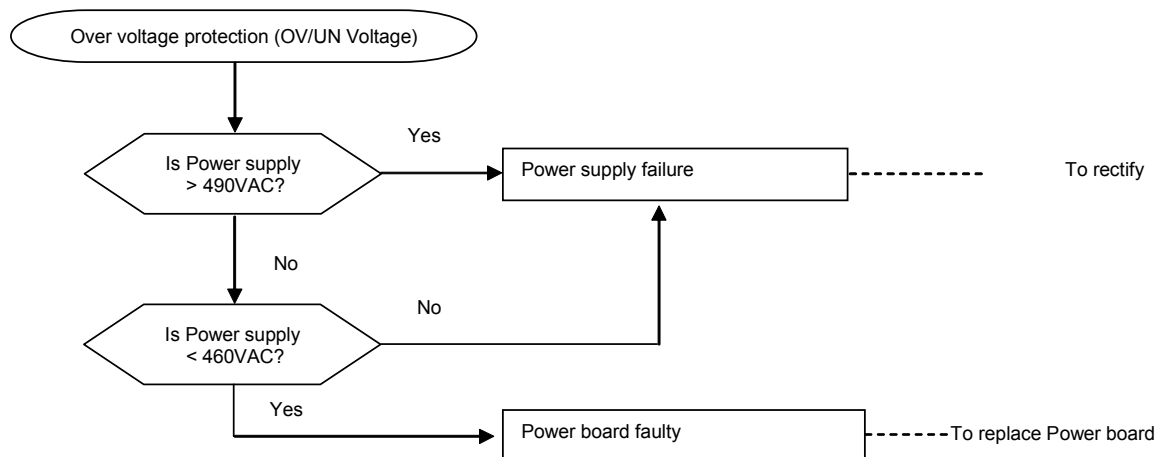
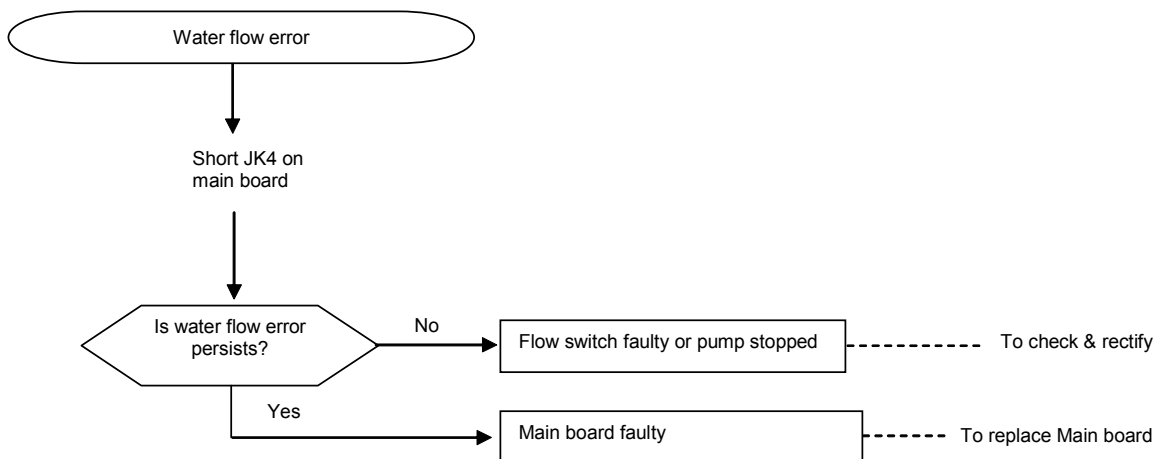
| ERROR DISPLAY                                     | ERROR DESCRIPTION                       | RESET<br>(default) | CONTROL MEASURE |         |     |          |     |
|---------------------------------------------------|-----------------------------------------|--------------------|-----------------|---------|-----|----------|-----|
|                                                   |                                         |                    | PUMP            | SYSTEM1 |     | SYSTEM 2 |     |
|                                                   |                                         |                    |                 | COMP    | FAN | COMP     | FAN |
| Phase Missing                                     | Phase missing                           | Manual             | OFF             | OFF     | OFF | OFF      | OFF |
| Phase Seq Error                                   | Wrong phase sequencing                  | Manual             | OFF             | OFF     | OFF | OFF      | OFF |
| Memory Error                                      | EEPROM read/write error                 | Auto               | OFF             | OFF     | OFF | OFF      | OFF |
| Entering Water sensor<br>Open/Short               | BPHE water in sensor error              | Auto               | OFF             | OFF     | OFF | OFF      | OFF |
| Leaving water sensor<br>Open/Short                | BPHE water out sensor error             | Auto               | OFF             | OFF     | OFF | OFF      | OFF |
| Outdoor Air sensor<br>Open/Short                  | Ambient temp sensor error               | Auto               | OFF             | OFF     | OFF | OFF      | OFF |
| Water Flow Error                                  | Cv contact opened                       | Manual             | OFF             | OFF     | OFF | OFF      | OFF |
| Cool Mode Antifreeze                              | Leaving water temp too low              | Auto               | OFF             | OFF     | OFF | OFF      | OFF |
| OV/UN Voltage                                     | Comp High Voltage (>490V)               | <460V, Auto        | OFF             | OFF     | OFF | OFF      | OFF |
| OV/UN Voltage                                     | Comp Low Voltage (<310V)                | >340V, Auto        | OFF             | OFF     | OFF | OFF      | OFF |
| Pump Overload                                     | Pump OLP closed                         | Auto               | OFF             | OFF     | OFF | OFF      | OFF |
| IPM Error                                         | IPM over-current or overheat            | Auto               | -               | OFF     | OFF | -        | -   |
| Comp 1 Overload                                   | Comp 1 overload                         | Auto               | -               | OFF     | OFF | -        | -   |
| Comp 1 Discharge<br>Overheat                      | Comp 1 discharge overheat               | Auto               | -               | OFF     | OFF | -        | -   |
| High Pressure 1                                   | System 1 high pressure                  | Auto               | -               | OFF     | OFF | -        | -   |
| Low Pressure 1                                    | System 1 low pressure                   | Auto               | -               | OFF     | OFF | -        | -   |
| Comp 1 Defrost<br>sensor Open/Short               | Coil out system 1 sensor<br>error       | Auto               | -               | OFF     | OFF | -        | -   |
| Comp 1 Suct sensor<br>Open/Short                  | Suction comp system 1<br>sensor error   | Auto               | -               | OFF     | OFF | -        | -   |
| Comp 1 Discharge<br>sensor Open/Short             | Discharge comp system 1<br>sensor error | Auto               | -               | OFF     | OFF | -        | -   |
| Coil 1 Inlet Temp<br>Open/Short                   | Coil In system 1 sensor error           | Auto               | -               | OFF     | OFF | -        | -   |
| V-Hx Inlet Temp<br>sensor Open/Short              | BPHE refrigerant in sensor<br>error     | Auto               | -               | OFF     | OFF | -        | -   |
| V-Hx Outlet Temp<br>Open/Short                    | BPHE refrigerant out sensor<br>error    | Auto               | -               | OFF     | OFF | -        | -   |
| Comp 2 Overload                                   | Comp 2 overload                         | Auto               | -               | -       | -   | OFF      | OFF |
| High Pressure 2                                   | System 2 high pressure                  | Auto               | -               | -       | -   | OFF      | OFF |
| Low Pressure 2                                    | System 2 low pressure                   | Auto               | -               | -       | -   | OFF      | OFF |
| Comp 2 Defrost<br>sensor Open/Short               | Coil out system 2 sensor<br>error       | Auto               | -               | -       | -   | OFF      | OFF |
| Comp 2 Discharge<br>sensor<br>Open/Short/Overheat | Discharge comp system 2<br>sensor error | Auto               | -               | -       | -   | OFF      | OFF |

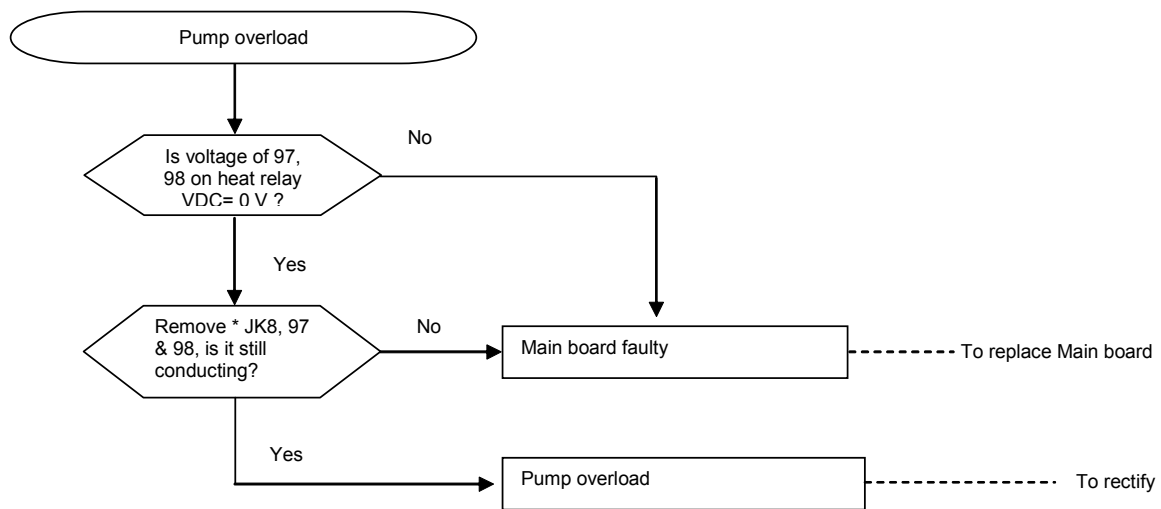
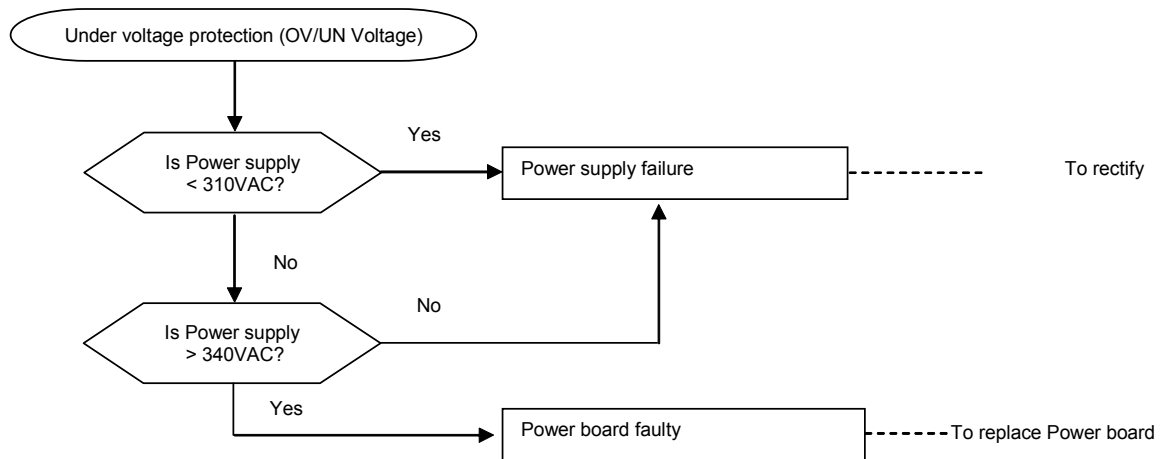
## Diagnostic flow chart



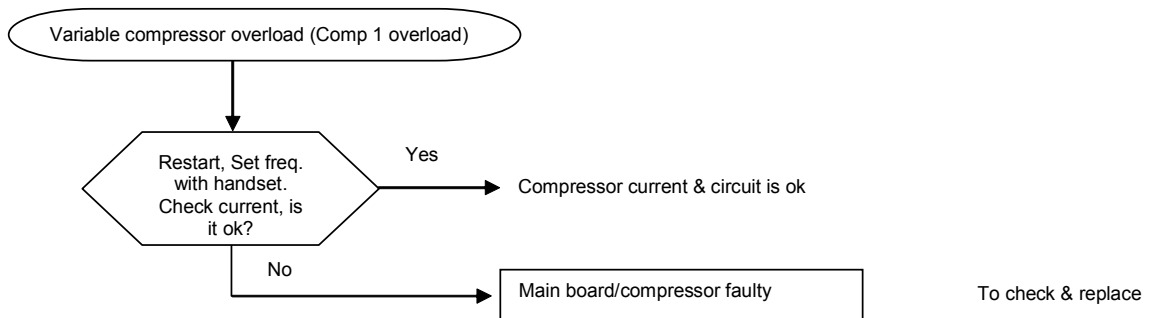
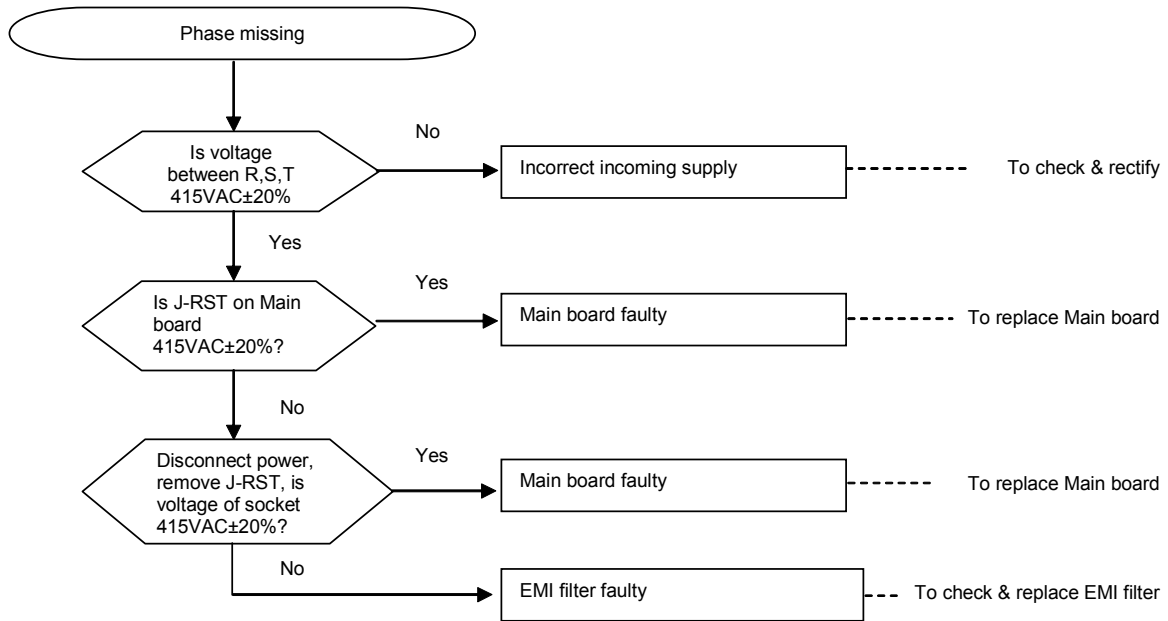


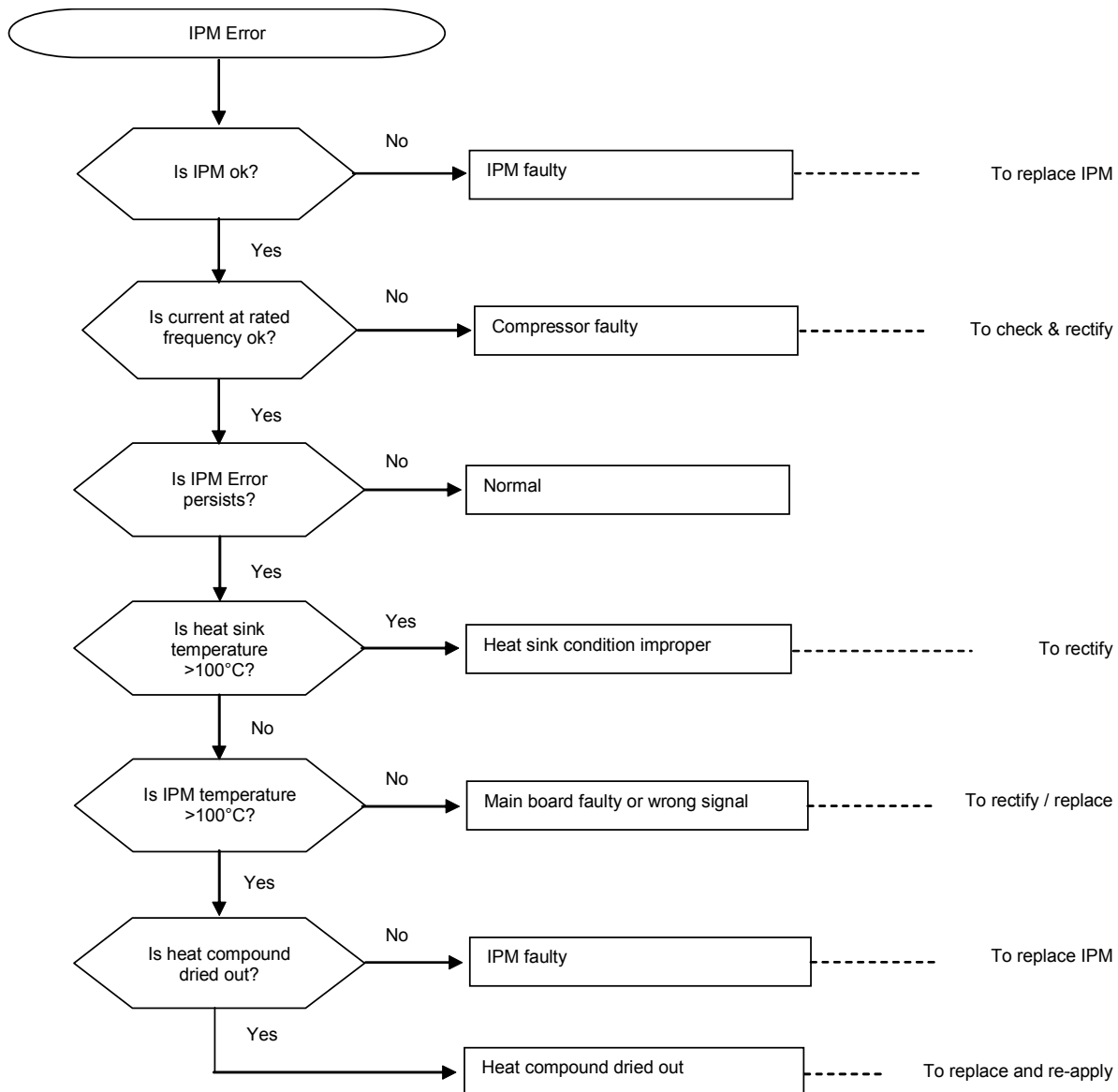
\* Faulty fuse should be replaced after the confirmation of IPM & compressor.

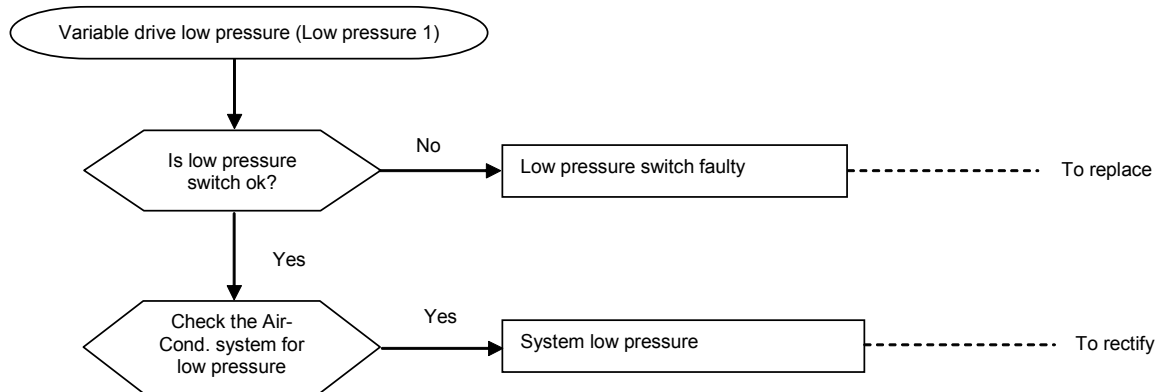
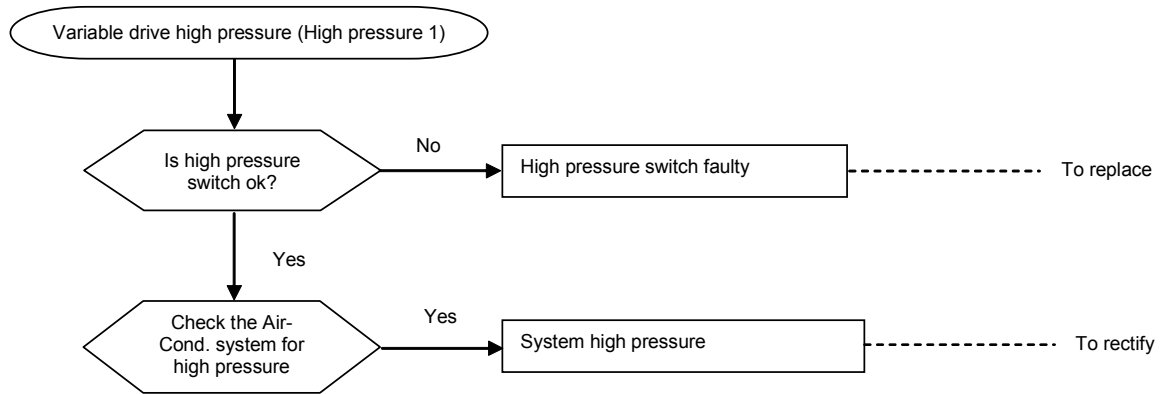


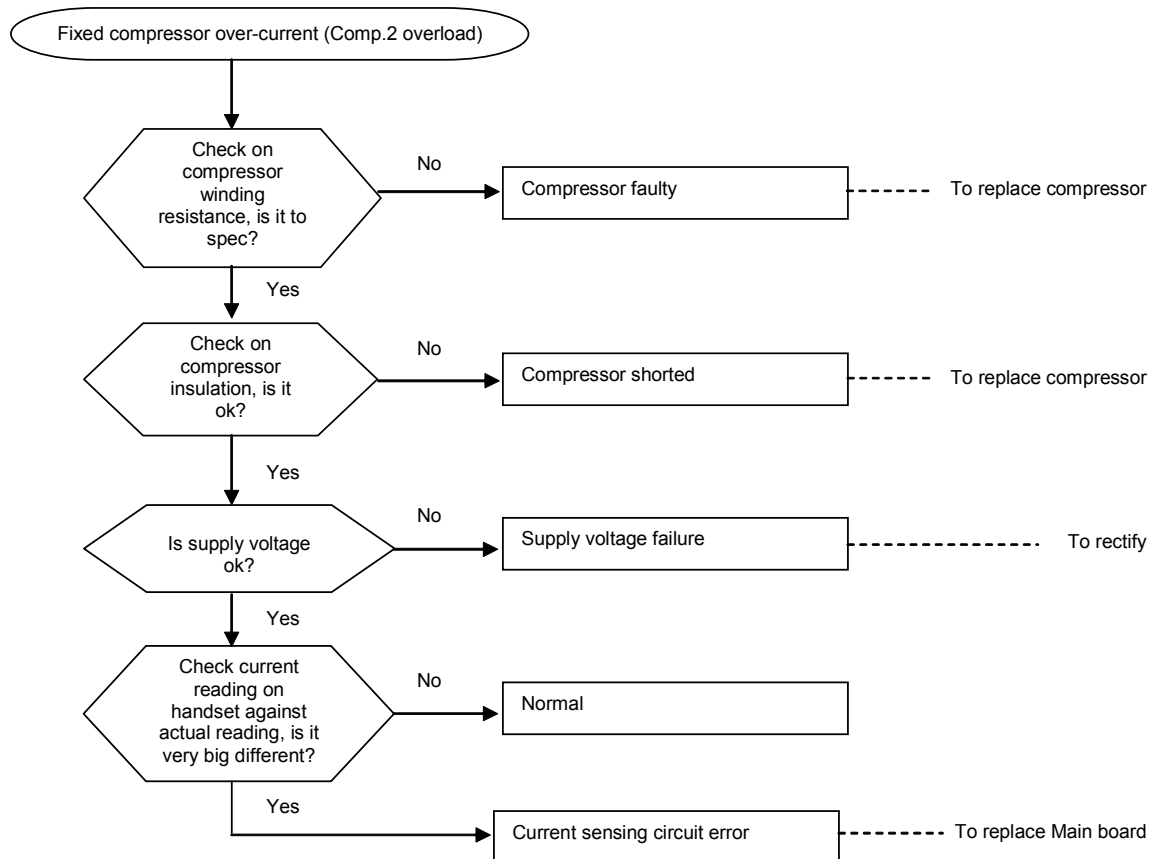
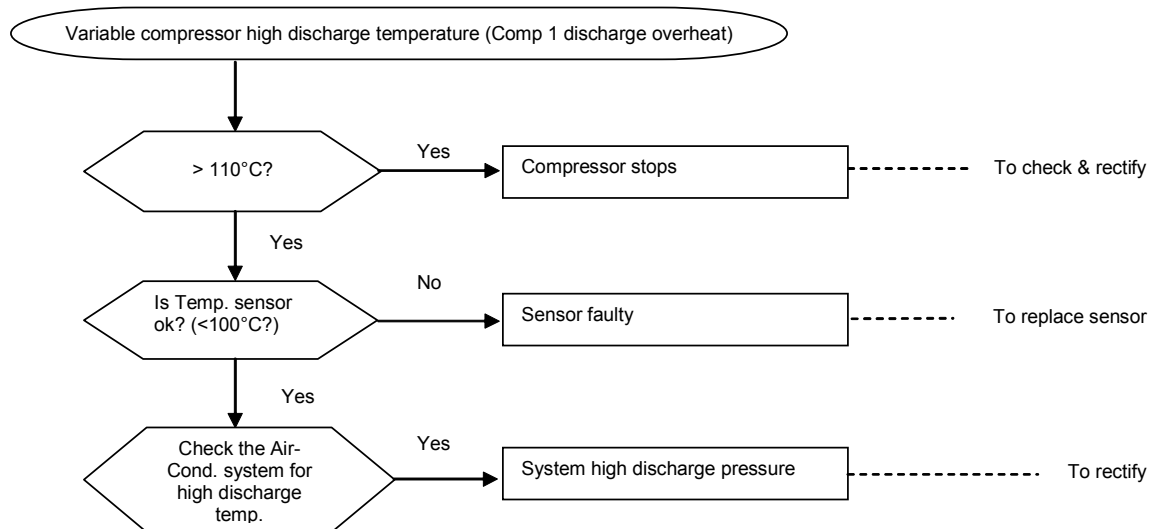


\* JK8 on main board



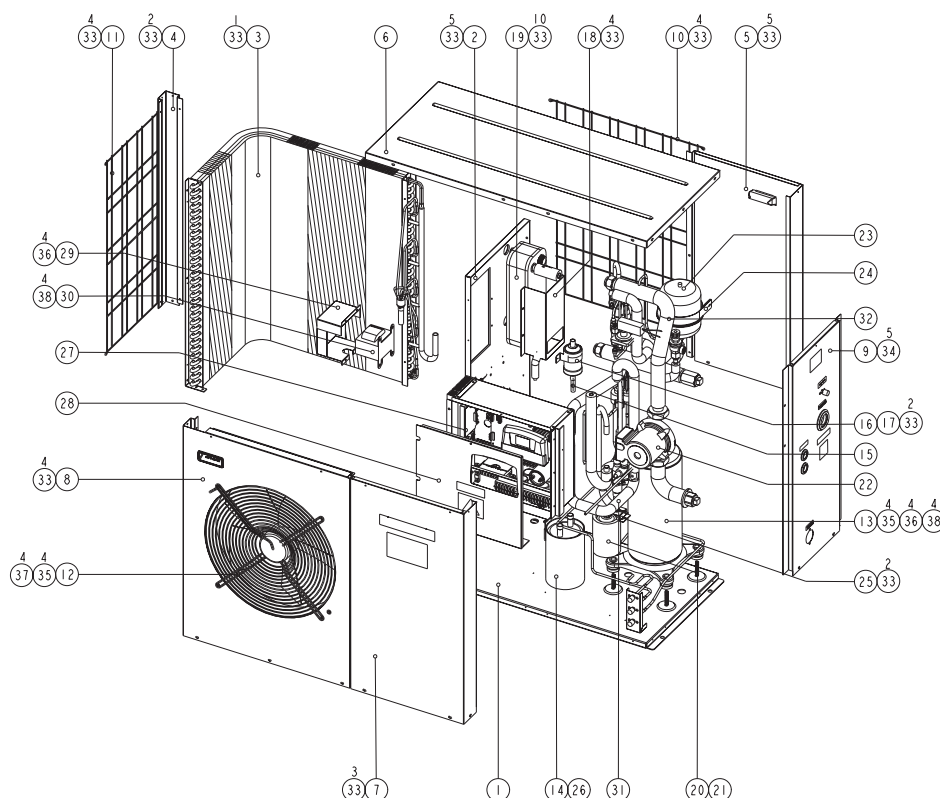






## 13. EXPLODED VIEW AND PART LISTS

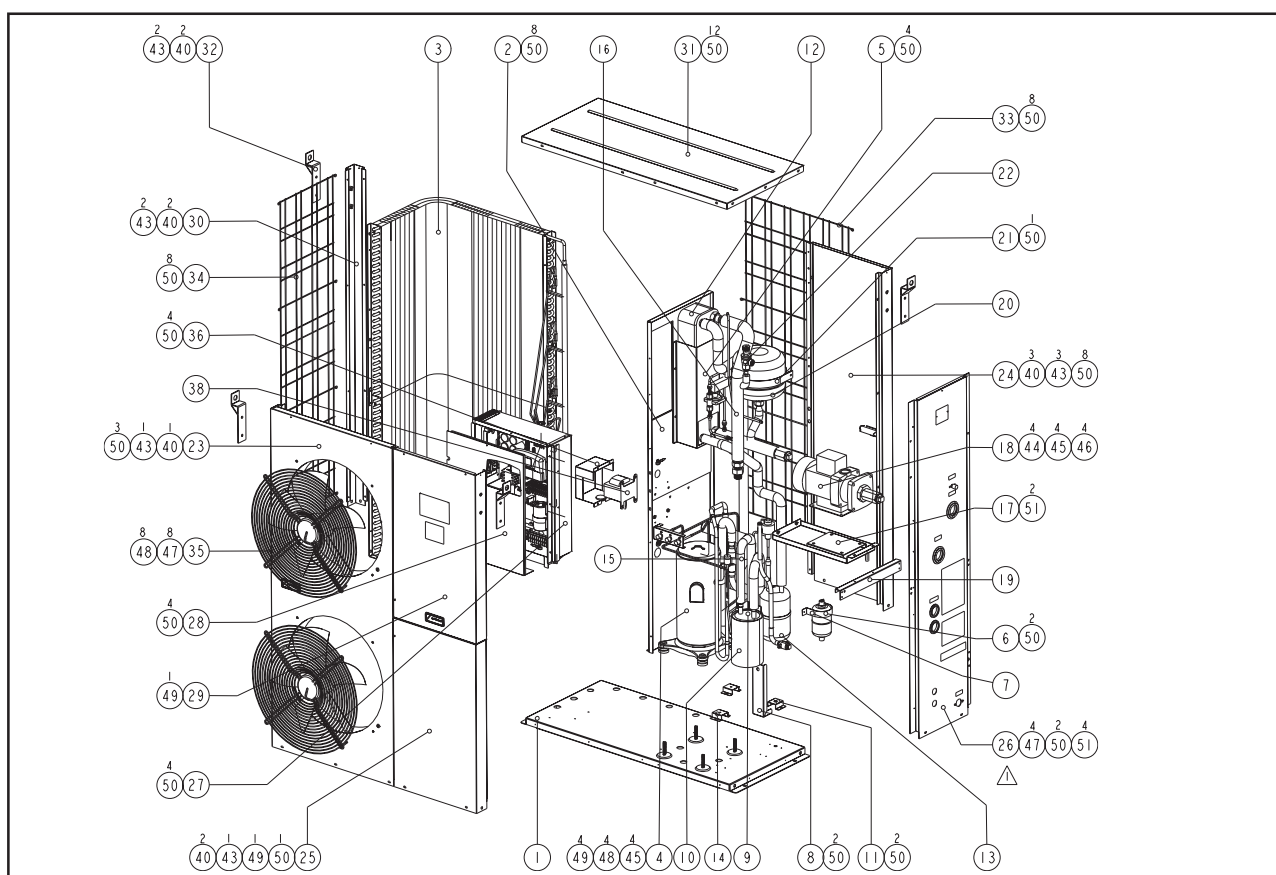
MODEL : A5ACV 30CR



| No | Description             | Part no         | No | Description                   | Part no         |
|----|-------------------------|-----------------|----|-------------------------------|-----------------|
| 1  | ASSY, BASE PAN          | R50 01 4 079444 | 19 | COMPENSATOR AFB-11            | R02 16 4 036982 |
| 2  | ASSY, PANEL PARTITION   | R50 01 4 079447 | 20 | INS. COMPENSATOR BODY         | -               |
| 3  | ASSY, COIL              | R50 02 4 082968 | 21 | WATER PUMP UPS25-125          | R04 13 9 018353 |
| 4  | PANEL, SUPPORT PILLAR   | R01 01 4 058974 | 22 | EXPANSION TANK 2L ELBI        | R05 01 9 018922 |
| 5  | STRUCTURE REAR RIGHT    | R01 01 4 069935 | 23 | CLAMP, EXPANSION TANK         | R01 01 4 072222 |
| 6  | PANEL TOP               | R01 01 4 064936 | 24 | SUPPORT, TUBE                 | R01 01 4 063180 |
| 7  | STRUCTURE FRONT RIGHT   | R01 01 4 069936 | 25 | INS, ACCUMULATOR BODY         | -               |
| 8  | ASSY, PANEL ORIFICE     | R50 01 4 060810 | 26 | ASSY, TERMINAL BOX MAIN       | R50 04 4 082101 |
| 9  | PANEL RIGHT             | R01 01 4 079475 | 27 | COVER CONTROL BOX             | R01 01 4 082098 |
| 10 | COIL GUARD, BACK        | R01 02 4 058986 | 28 | PANEL, COVER REACTOR          | R01 01 4 081033 |
| 11 | COIL GUARD, LEFT        | R01 02 4 058985 | 29 | REACTOR                       | -               |
| 12 | ASSY, FAN MOTOR MORRILL | R50 03 9 019117 | 30 | SCREW, PTT SUS M4x12mm        | R07 01 9 010836 |
| 13 | COMP. ASSY ANV33FKBMT   | R50 04 9 024773 | 31 | SCREW, JD COATING PTS M5 x 16 | R07 01 9 010843 |
| 14 | ACCUMULATOR, R65W       | R02 11 9 016393 | 32 | NUT, C/W FLANGE M8            | R07 02 4 059149 |
| 15 | CLIP, FILTER DRIER      | R01 01 4 071927 | 33 | SPACER                        | R01 02 9 024769 |
| 16 | FILTER DRIER            | R02 16 9 018760 | 34 | WASHER, FLAT                  | R07 04 4 003869 |
| 17 | CLAMP, BPHE             | R01 01 4 061321 | 35 | WASHER, FLAT                  | R07 01 4 003768 |
| 18 | ASSY, BPHE              | R50 02 4 080515 | 36 | SCREW, JD COATING PTT M5x12   | R07 01 9 010838 |

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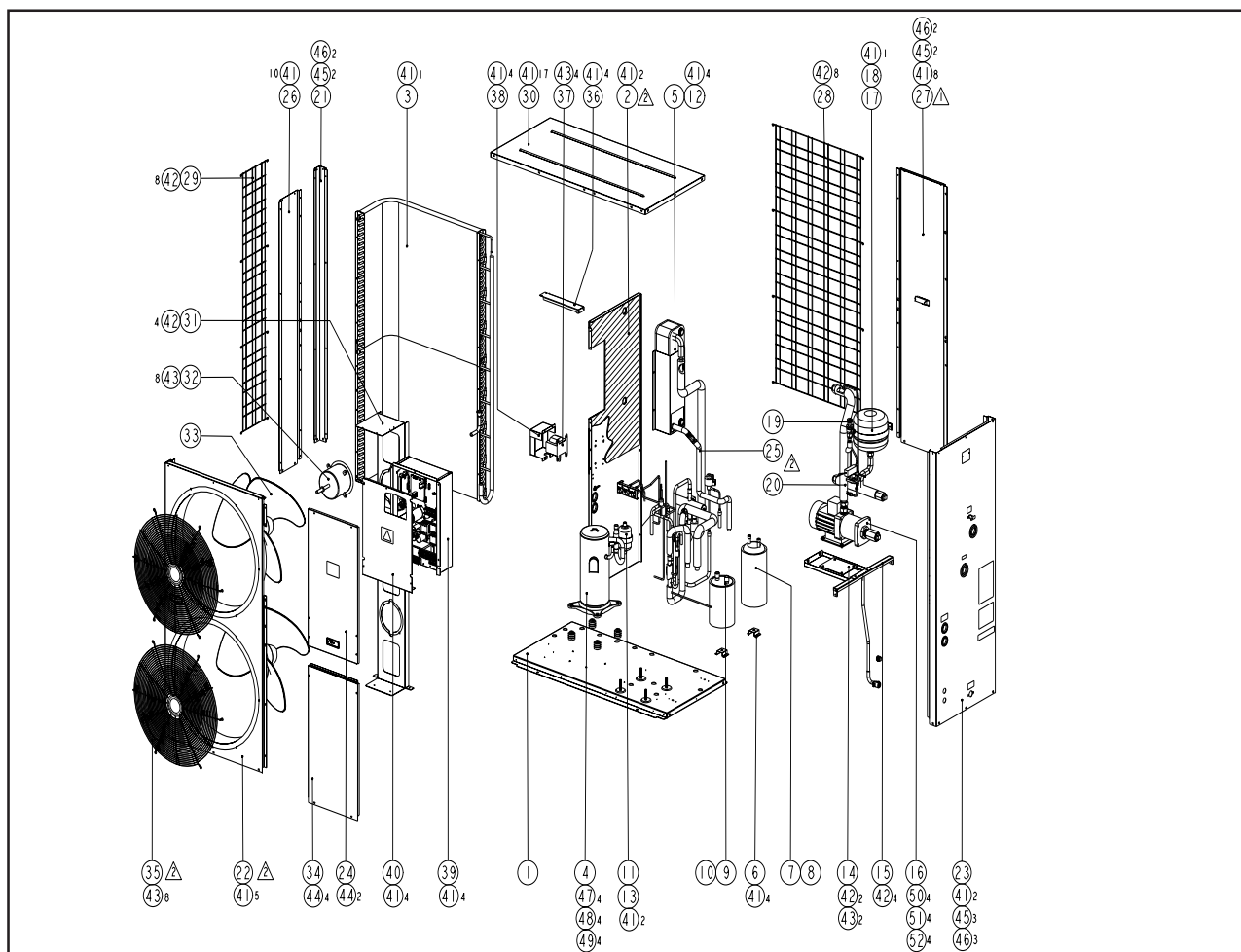
## MODEL : A5ACV 55CR



| No | Description                      | Part no         | No | Description                     | Part no         |
|----|----------------------------------|-----------------|----|---------------------------------|-----------------|
| 1  | ASSY, PANEL BASE                 | R50 01 4 079682 | 25 | ASSY, TERMINAL BOX MAIN         | R50 04 4 082048 |
| 2  | ASSY, PANEL PARTITION            | R50 01 4 080005 | 26 | ASSY, COVER CONTROL BOX         | R01 01 4 082049 |
| 3  | ASSY, COIL                       | R50 02 4 079683 | 27 | ASSY, STRUCTURE FRONT RIGHT TOP | R50 01 4 082086 |
| 4  | COMP. ASSY ANV47FKBMT            | R50 04 9 024220 | 28 | ASSY, SUPOPT PILLAR             | R50 01 4 062762 |
| 5  | CLAMP, BPHE                      | R01 01 4 061748 | 29 | ASSY, INS. PANEL TOP            | R01 01 4 064936 |
| 6  | CLIP, FILTER DRIER               | R01 01 4 071226 | 30 | ASSY, SUPORT HOISTING BRACKET   | R50 01 4 022906 |
| 7  | FILTER DRIER                     | R02 16 4 034987 | 31 | COIL GUARD, BACK                | R01 02 4 058841 |
| 8  | SUPPORT, ACCUMULATOR             | R01 01 4 079828 | 32 | COIL GUARD, LEFT                | R01 02 4 058840 |
| 9  | ACCUMULATOR, R65W                | R02 11 9 016393 | 33 | ASSY, FAN MOTOR MORRILL         | R50 03 9 019117 |
| 10 | INS, ACCUMULATOR BODY            | -               | 34 | PANEL, COVER REACTOR            | R01 01 4 081033 |
| 11 | SUPPORT, ACCU. & LQD. RECEIVER   | R01 01 4 059624 | 35 | BUSH, RUBBER                    | R11 01 4 001876 |
| 12 | ASSY, BPHE                       | R50 02 4 079933 | 36 | REACTOR                         | -               |
| 13 | LIQUID RECEIVER                  | R02 11 9 020906 | 37 | WASHER, SPRING                  | R07 04 4 002246 |
| 14 | SUPPORT, TUBE                    | R01 01 4 063180 | 38 | SPACER                          | R01 02 9 024769 |
| 15 | ASSY, PUMP BASE                  | R50 01 4 065859 | 39 | RUBBER GROMMET                  | R11 04 4 024768 |
| 16 | WATER PUMP CH2-30                | R04 13 9 021184 | 40 | BOLT, HEX M8 x20                | R07 03 4 003822 |
| 17 | PLATE, PUMP SUPPORT              | R01 01 4 061851 | 41 | SCREW, PHILIP PAN HEAD M6 x15mm | R07 01 4 010157 |
| 18 | EXPANSION TANK                   | R05 01 9 018923 | 42 | WASHER SPRING                   | R07 04 4 003769 |
| 19 | CLAMP, EXPANSION TANK            | R01 01 4 068177 | 43 | WASHER, FLAT                    | -               |
| 20 | PRESSURE RELIEF VALVE            | R05 02 4 050808 | 44 | SCREW, JD COATING PTS M5 x16    | R07 01 9 010843 |
| 21 | ASSY, PANEL ORIFICE              | R50 01 4 060812 | 45 | WASHER, FLAT                    | R07 04 4 003869 |
| 22 | ASSY, STRUCTURE REAR RIGHT       | R50 01 4 064939 | 46 | SCREW, SELF TAPPING             | R07 01 4 002248 |
| 23 | ASSY, STRUCTURE, FRONT RIGHT TOP | R50 01 4 082086 | 47 | SCREW, PTT SUS M4x12            | R07 01 9 010836 |
| 24 | PANEL RIGHT                      | R01 01 4 079937 | 48 | SCREW, JD COATING PTT M5 x12    | R07 01 9 010838 |

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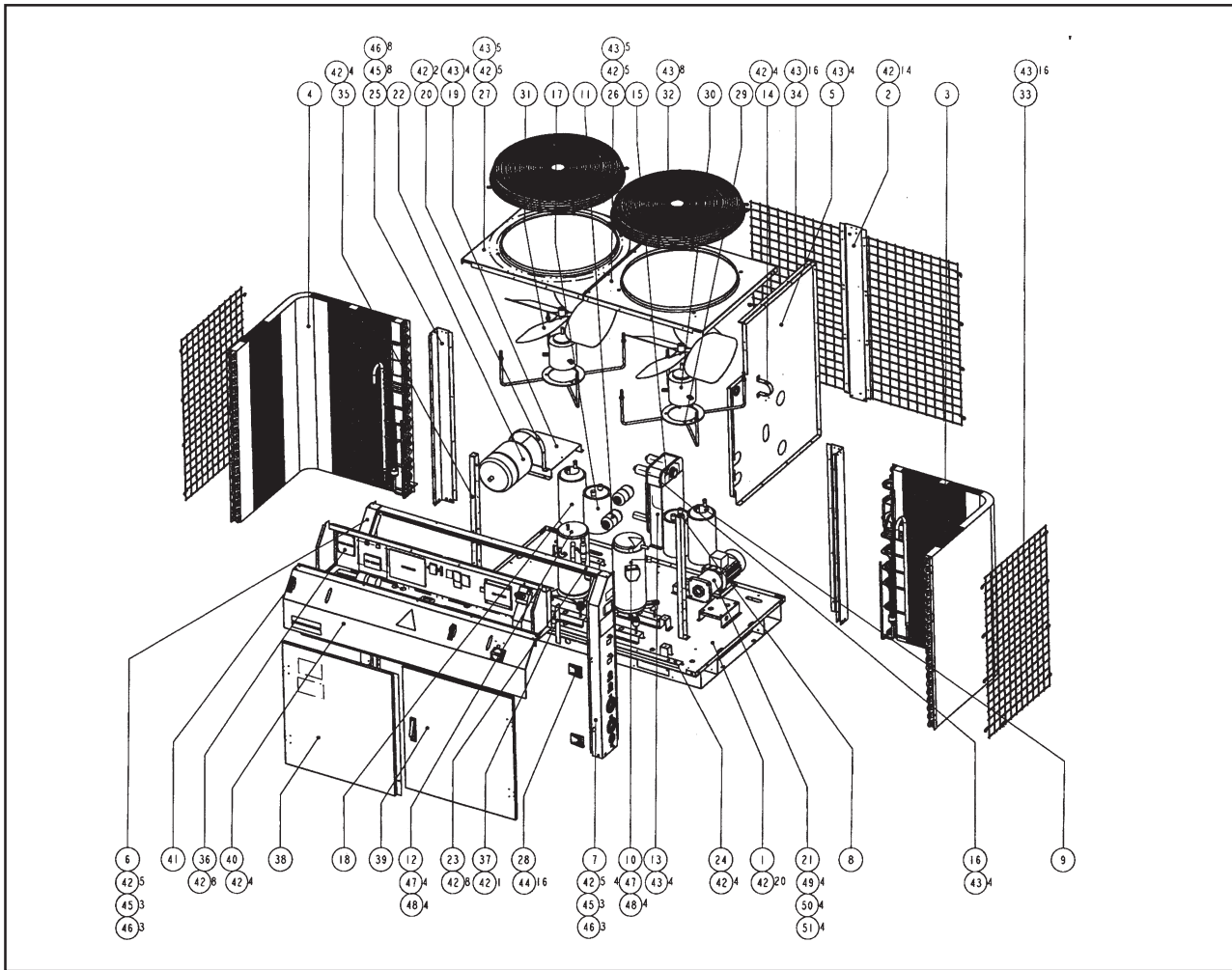
## MODEL : A5ACV 75CR



| No | Description                       | Part no         | No | Description                   | Part no         |
|----|-----------------------------------|-----------------|----|-------------------------------|-----------------|
| 1  | ASSY, BASE PAN                    | R50 01 4 078737 | 27 | STRUCTURE REAR RIGHT          | R01 01 4 078641 |
| 2  | ASSY, PANEL PARTITION             | R50 01 4 078744 | 28 | COIL GUARD, BACK              | R01 02 4 078750 |
| 3  | ASSY, COIL                        | R50 02 4 078902 | 29 | COIL GUARD RIGHT              | R01 02 4 078751 |
| 4  | COMP. ASSY ANV47FKBMT             | R50 04 9 024220 | 30 | INS. PANEL TOP                | R01 01 4 078652 |
| 5  | ASSY, BPHE                        | R02 20 9 024775 | 31 | ASSY, BRACKET MOTOR           | R50 01 4 085856 |
| 6  | SUPPORT, ACCU., & LIQUID RECEIVER | R01 01 4 059624 | 32 | MOTOR                         | R03 03 9 016103 |
| 7  | LIQUID RECEIVER                   | R02 11 9 024280 | 33 | FAN BLADE                     | R03 01 3 028160 |
| 8  | INS, LIQUID RECEIVER BODY         | -               | 34 | STRUCTURE, FRONT RIGHT BOTTOM | R01 01 4 078643 |
| 9  | ACCUMULATOR                       | R02 11 9 015506 | 35 | FAN BLADE                     | R01 02 4 078747 |
| 10 | INS, ACCUMULATOR BODY             | -               | 36 | SUPPORT, MOTOR BRACKET        | R01 01 4 078917 |
| 11 | FILTER DRIER                      | R02 16 4 034987 | 37 | REACTOR                       | -               |
| 12 | CLAMP, BPHE                       | R01 01 4 078653 | 38 | PANEL, COVER REACTOR          | R01 01 4 081033 |
| 13 | CLIP, FILTER DRIER                | R01 01 4 071226 | 39 | ASSY, TERMINAL BOX MAIN       | R50 04 4 083597 |
| 14 | ASSY, PUMP BASE                   | R50 01 4 082718 | 40 | COVER TERMINAL BOX            | R01 01 4 078654 |
| 15 | PLATE, PUMP SUPPORT               | R01 01 4 078637 | 41 | SCREW, M4x12                  | R07 01 9 010836 |
| 16 | WATER PUMP CH4-40(AUUE)           | R04 13 9 021185 | 42 | SCREW, M5x16                  | R07 01 9 010839 |
| 17 | EXPANSION TANK 5L                 | R05 01 9 018923 | 43 | SCREW, 5x16                   | R07 01 9 010843 |
| 18 | CLAMP, EXPANSION TANK             | R01 01 4 068177 | 44 | SCREW, TRUSS HEAD             | R07 01 4 002221 |
| 19 | PRESSURE RELIEF VALVE             | R05 02 4 050808 | 45 | BOLT HEX M8x20                | R07 03 4 003822 |
| 20 | ASSY, WATER PIPING                | -               | 46 | WASHER SPRING                 | R07 04 4 002246 |
| 21 | PANEL, SUPPORT PILLAR             | R01 01 4 078638 | 47 | NUT, C/W FLANGE M8            | R07 02 4 059149 |
| 22 | ASSY, PANEL ORIFICE               | R50 01 4 078740 | 48 | RUBBER GROMMET                | -               |
| 23 | ASSY, PANEL RIGHT (MAIN)          | R50 01 4 086750 | 49 | SPACER                        | -               |
| 24 | ASSY, STRUCTURE FRONT RIGHT TOP   | R01 01 4 078642 | 50 | SCREW, PHILIP PAN HEAD        | R07 01 4 010157 |
| 25 | ASSY, UNIT TUBING                 | -               | 51 | WASHER, SPRING                | R07 04 4 003769 |
| 26 | PANEL, SIDE LEFT                  | R01 01 4 079744 | 52 | WASHER, FLAT                  | R07 01 4 003768 |

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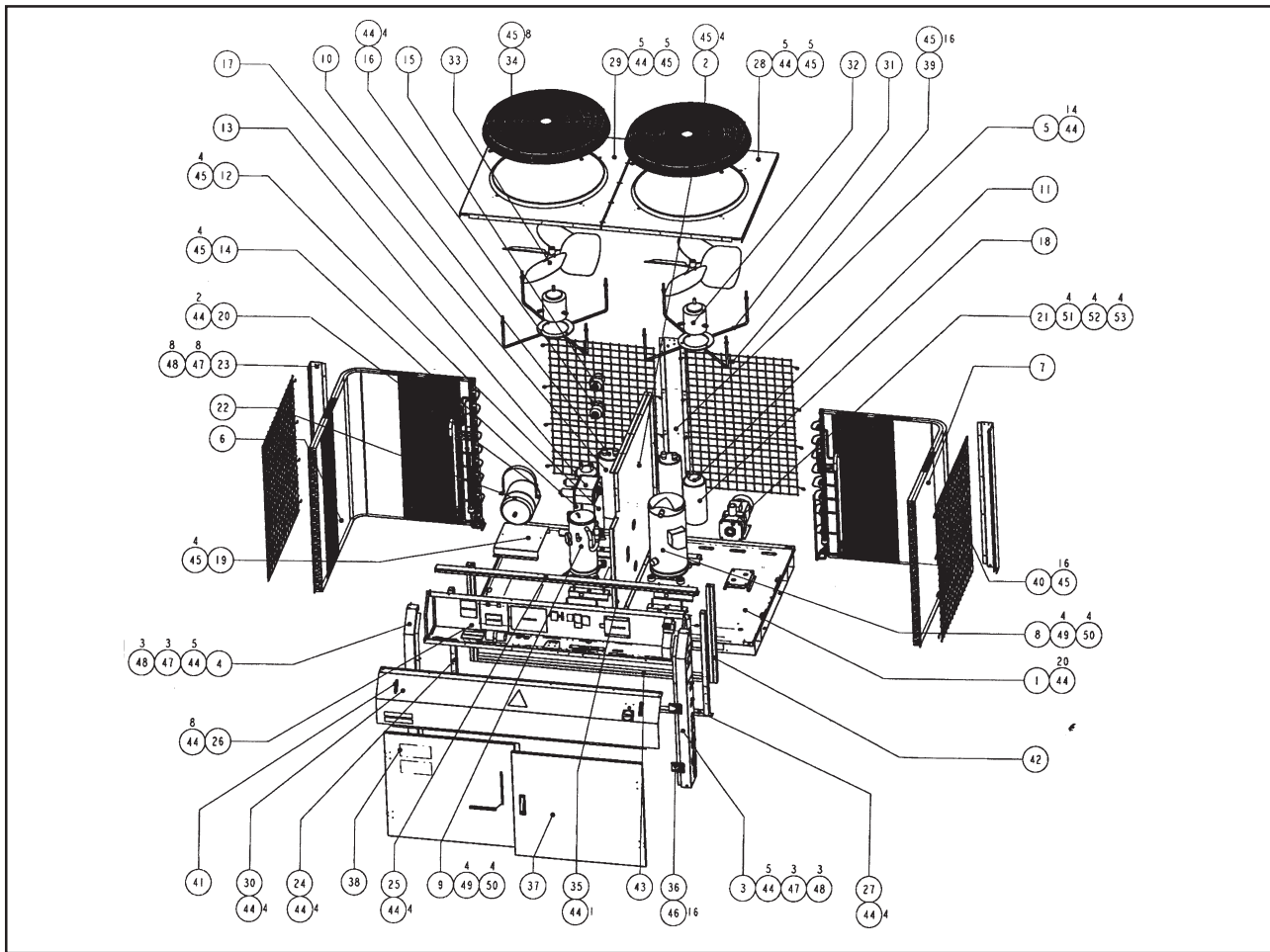
## MODEL : A5ACV100CR



| NO | DESCRIPTIONS              | PART NO         | NO | DESCRIPTIONS                 | PART NO         |
|----|---------------------------|-----------------|----|------------------------------|-----------------|
| 1  | ASSY, PANEL BASE MAIN     | R50 01 4 077857 | 27 | PANEL, ORIFICE LEFT          | R01 01 4 082120 |
| 2  | COIL SUPPORT              | R01 01 4 077862 | 28 | HINGE, DOOR                  | R01 02 9 016097 |
| 3  | ASSY, COIL RIGHT          | R50 01 4 077891 | 29 | BRACKET, MOTOR               | R01 02 4 096383 |
| 4  | ASSY, COIL LEFT           | R50 01 4 077893 | 30 | MOTOR                        | R03 03 9 015508 |
| 5  | ASSY, PARTITION PANEL     | R50 01 4 077863 | 31 | FAN BLADE 24"                | R03 02 9 015512 |
| 6  | LEFT PANEL                | R01 01 4 082112 | 32 | FAN GUARD                    | R01 02 4 055748 |
| 7  | RIGHT PANEL               | R01 01 4 082113 | 33 | COIL GUARD, LEFT/RIGHT       | R01 02 4 055744 |
| 8  | ACCUMULATOR               | R02 11 9 015506 | 34 | COIL GUARD, BACK             | R01 02 4 055745 |
| 9  | LIQUID RECEIVER           | R02 11 9 024280 | 35 | PANEL, TERMINAL BOX SUPPORT  | R01 01 4 054717 |
| 10 | COMPRESSOR ASSY           | R50 04 9 024063 | 36 | ASSY, TERMINAL BOX MAIN      | R50 04 4 078888 |
| 11 | FILTER DRIER              | R02 16 4 034987 | 37 | PLATE, PARTITION             | R01 01 4 056603 |
| 12 | COMP. ASSY INVERTER       | R50 04 9 024220 | 38 | DOOR PANEL LEFT              | R50 01 4 056078 |
| 13 | BRACKET, BPHE             | R01 01 4 077865 | 39 | DOOR PANEL RIGHT             | R50 01 4 074752 |
| 14 | CLIP, FILTER DRIER        | R01 01 4 054752 | 40 | FRONT PANEL MAIN             | R01 01 4 082114 |
| 15 | ASSY, BPHE                | R02 20 9 024222 | 41 | ASSY, PANEL HOOK             | R50 12 9 016096 |
| 16 | CLAMP, BPHE               | R01 01 4 077866 | 42 | SCREW, PTT SUS M4X12         | R07 01 9 010836 |
| 17 | INS, ACCUMULATOR BODY     | -               | 43 | SCREW, JD COATING P.T. M5X16 | R07 01 9 010839 |
| 18 | INS, LIQUID RECEIVER BODY | -               | 44 | SCREW, TRUST HEAD PHILIP     | R07 01 4 002221 |
| 19 | SUPPORT, EXPANSION TANK   | R01 01 4 054712 | 45 | BOLT HEX M8X20               | R07 03 4 003822 |
| 20 | CLAMP, EXPANSION TANK     | R01 01 4 054754 | 46 | WASHER, SPRING               | R07 04 4 002246 |
| 21 | WATER PUMP CH4-40         | R04 13 9 021185 | 47 | NUT, C/W FLANGE M8           | -               |
| 22 | TANK, EXPANSION 8L        | R05 01 4 001497 | 48 | SPACER                       | -               |
| 23 | PANEL, SUPPORT FRONT      | R01 01 4 082118 | 49 | SCREW, PHILP PAN HEAD        | R07 01 4 010157 |
| 24 | SUPPORT, FLUTTED WIRE     | R01 01 4 054762 | 50 | WASHER, SPRING               | R07 04 4 003769 |
| 25 | STRUCTURE, BACK L/R       | R01 01 4 054710 | 51 | WASHER, FLAT                 | R07 01 4 003768 |
| 26 | PANEL, ORIFICE RIGHT      | R01 01 4 082121 |    |                              |                 |

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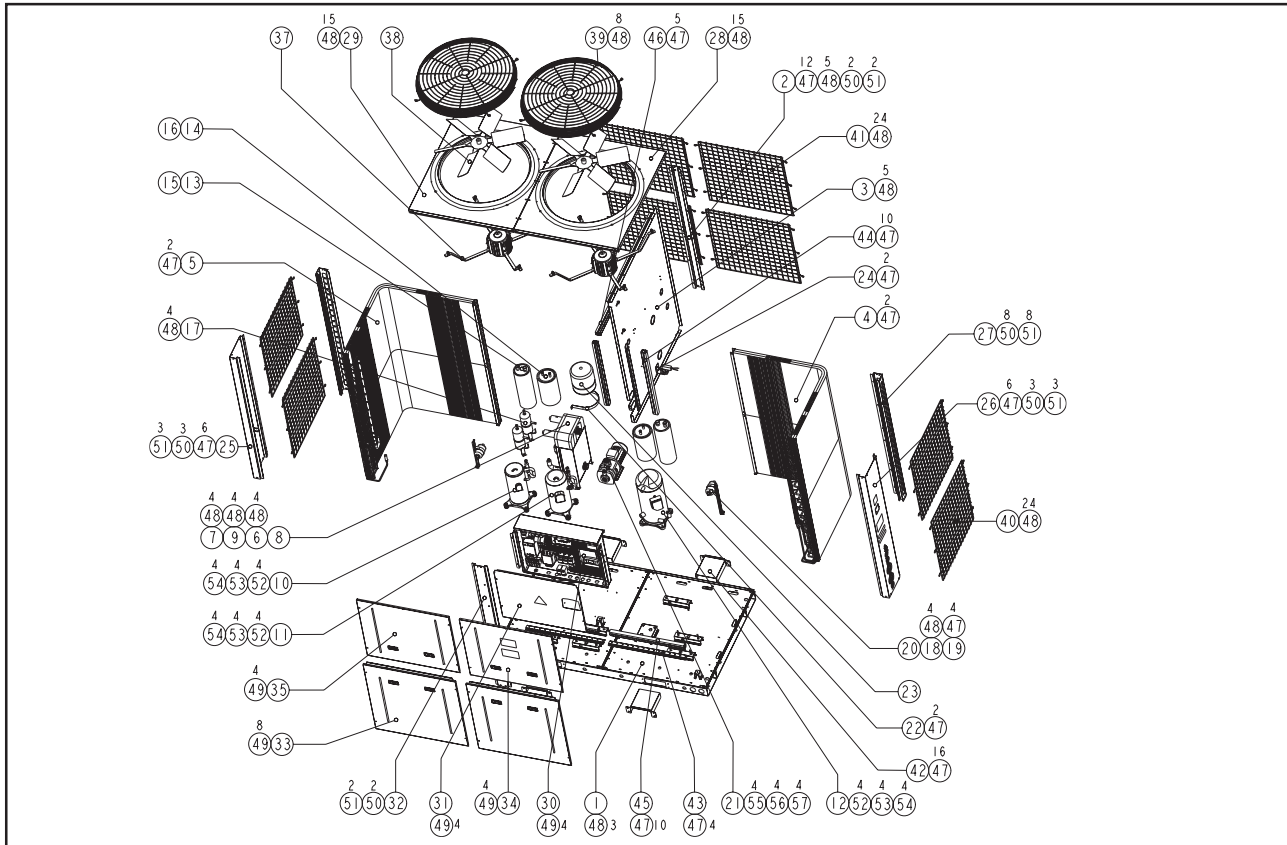
## MODEL : A5ACV135CR



| NO | DESCRIPTIONS                | PART NO         | NO | DESCRIPTIONS           | PART NO         |
|----|-----------------------------|-----------------|----|------------------------|-----------------|
| 1  | ASSY, PANEL BASE MAIN       | R50 01 4 079125 | 28 | PANEL, RIGHT ORIFICE   | R01 01 4 082123 |
| 2  | ASSY, PARTITION PANEL       | R50 01 4 079128 | 29 | PANEL, LEFT ORIFICE    | R01 01 4 082122 |
| 3  | RIGHT PANEL                 | R01 01 4 082113 | 30 | FRONT PANEL MAIN       | R01 01 4 082116 |
| 4  | LEFT PANEL                  | R01 01 4 082112 | 31 | BRACKET, MOTOR         | R01 01 4 096382 |
| 5  | COIL SUPPORT                | R01 01 4 077862 | 32 | MOTOR                  | R03 03 9 018421 |
| 6  | ASSY, COIL LEFT             | R50 02 4 079161 | 33 | FAN BLADE 26"          | R03 02 9 015513 |
| 7  | ASSY, COIL RIGHT            | R50 02 4 079163 | 34 | FAN GUARD              | R01 02 4 055747 |
| 8  | COMPRESSOR ASSY             | R50 04 9 024296 | 35 | PLATE, PARTITION       | R01 01 4 056603 |
| 9  | COMP. ASSY INVERTER         | R50 04 9 024220 | 36 | HINGE, DOOR            | R01 02 9 016097 |
| 10 | ACCUMULATOR                 | R02 11 9 015245 | 37 | ASSY DOOR PANEL RIGHT  | R50 01 4 074750 |
| 11 | LIQUID RECEIVER             | R02 11 9 024280 | 38 | ASSY, DOOR PANEL LEFT  | R50 01 4 055347 |
| 12 | BRACKET, BPHE               | R01 01 4 077865 | 39 | COIL GUARD, BACK       | R01 02 4 055743 |
| 13 | ASSY, BPHE                  | R50 02 4 079159 | 40 | COIL GUARD, LEFT/RIGHT | R01 02 4 055746 |
| 14 | CLAMP, BPHE                 | R01 01 4 079131 | 41 | ASSY, PANEL HOOK       | R50 12 9 016096 |
| 15 | FILTER DRIER                | R02 16 4 034987 | 42 | PVC, TRUNKING          | R12 02 4 057612 |
| 16 | CLIP, FILTER DRIER          | R01 01 4 054752 | 43 | PVC, TRUNKING          | -               |
| 17 | INS, ACCUMULATOR BODY       | -               | 44 | SCREW, PTT SUS M4X12   | R07 01 9 010836 |
| 18 | INS, LIQUID RECEIVER BODY   | -               | 45 | SCREW, JD COATING P.T. | R07 01 9 010839 |
| 19 | SUPPORT, EXPANSION TANK     | R01 01 4 054712 | 46 | SCREW, PHILP PAN HEAD  | R07 01 4 002221 |
| 20 | CLAMP, EXPANSION TANK       | R01 01 4 054754 | 47 | BOLT HEX M8X20         | R07 03 4 003822 |
| 21 | WATER PUMP CH8-30           | R04 13 9 021186 | 48 | WASHER, SPRING         | R07 04 4 002246 |
| 22 | TANK, EXPANSION 8L          | R05 01 4 001497 | 49 | NUT, C/W FLANGE M8     | -               |
| 23 | STRUCTURE, BACK L/R         | R01 01 4 054710 | 50 | SPACER                 | -               |
| 24 | PANEL, TERMINAL BOX SUPPORT | R01 01 4 054717 | 51 | SCREW, PHILIP PAN HEAD | R07 01 4 010157 |
| 25 | PANEL, SUPPORT FRONT        | R01 01 4 082119 | 52 | WASHER, SPRING         | R07 04 4 003769 |
| 26 | ASSY, TERMINAL BOX MAIN     | R50 04 4 079552 | 53 | WASHER, FLAT           | R07 01 4 003768 |
| 27 | SUPPORT, WIRE BOARD         | R01 01 4 054724 |    |                        |                 |

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# **MODEL : A5ACV210CR**



| NO | DESCRIPTION                          | PART NO         | N<br>O | DESCRIPTION                           | PART NO         |
|----|--------------------------------------|-----------------|--------|---------------------------------------|-----------------|
| 1  | ASSY, PANEL BASE MAIN                | R50 01 4 084901 | 30     | ASSY, CONTROL BOX                     | R50 04 4 089239 |
| 2  | PANEL, COIL SUPPORT                  | R01 01 4 083984 | 31     | ASSY, COVER TERMINAL BOX              | R01 01 4 084609 |
| 3  | ASSY, PANEL PARTITION                | R50 01 4 083980 | 32     | ASSY, PANEL CENTER                    | R50 01 4 084213 |
| 4  | ASSY, COIL RIGHT (GOLD FIN)          | R50 02 4 084041 | 33     | PANEL, FRONT BOTTOM                   | R01 01 4 086996 |
| 5  | ASSY, COIL LEFT (GOLD FIN)           | R50 02 4 084040 | 34     | PANEL FRONT RIGHT TOP                 | R50 01 4 086994 |
| 6  | BRACKET, BPHE                        | R01 01 4 084911 | 35     | PANEL FRONT LEFT TOP                  | R50 01 4 085254 |
| 7  | PANEL, SUPPORT BPHE                  | R01 01 4 087701 | 36     | MOTOR, YDK550-8AC                     | R03 03 9 028560 |
| 8  | ASSY, BPHE                           | R50 02 4 084902 | 37     | BRACKET, FAN MOTOR 32"                | R01 02 4 051691 |
| 9  | CLAMP, BPHE                          | R01 01 4 084910 | 38     | FAN BLADE                             | R03 01 9 021351 |
| 10 | ASSY, COMP.ANV47FKBMT MIT.           | R50 04 9 024220 | 39     | FAN GUARD 32"                         | R01 02 4 048691 |
| 11 | ASSY, COMP. BN65YFAMT SIAM           | R50 04 9 026991 | 40     | COIL GUARD, LEFT/RIGHT                | R01 02 4 085033 |
| 12 | ASSY. COMP. ZP137KCE-TFD<br>COPELAND | R50 04 9 026989 | 41     | COIL GUARD, BACK                      | R01 02 4 086957 |
| 13 | ACCUMULATOR (A-AS 5179)              | R02 11 9 015245 | 42     | PANEL, COVER                          | R01 01 4 087049 |
| 14 | LIQUID RECEIVER                      | R02 11 9 028389 | 43     | SUPPORT, WIRE BOARD                   | R01 01 4 087979 |
| 15 | INS. ACCUMULATOR BODY                | R06 01 4 056067 | 44     | PVC TRUNKING (33.0 x 45.0 x<br>808.0) | R12 02 4 087981 |
| 16 | INS. LIQUID RECEIVER BODY            | R06 01 4 088638 | 45     | PVC TRUNKING (33.0 x 45.0 x<br>710.0) | R12 02 4 057612 |
| 17 | OIL SEPERATOR                        | R02 11 9 028561 | 46     | PVC TRUNKING (33.0 x 45.0 x<br>860.0) | R12 02 4 087980 |
| 18 | PANEL, SUPPORT FILTER DRIER          | R01 01 4 084043 | 47     | SCREW, PTT SUS M4x12                  | R07 01 9 010836 |
| 19 | CLIP, FILTER DRIER                   | R01 01 4 054752 | 48     | SCREW, JD COATING P.T.<br>M5x16       | R07 01 9 010839 |
| 20 | FILTER DRIER, BFK165S                | R02 16 4 034987 | 49     | SCREW, JD COATING P.T. S<br>5x16      | R07 01 9 010843 |
| 21 | WATER PUMP, GRUNDFOS                 | R04 13 9 026993 | 50     | BOLT HEX M8x20                        | R07 03 4 003822 |
| 22 | CLAMP, EXPANSION TANK                | R01 01 4 054754 | 51     | WASHER, SPRING                        | R07 04 4 002246 |
| 23 | EXPANSION TANK 8L                    | R05 01 4 001497 | 52     | NUT, C/W FLANGE M8                    | R07 02 4 059149 |
| 24 | BRACKET, DEF. PRESS SWITCH           | R01 01 4 096131 | 53     | RUBBER GROMMET                        | -               |
| 25 | ASSY, SIDE PANEL LEFT (MAIN)         | R50 01 4 085865 | 54     | SPACER                                | -               |
| 26 | ASSY, SIDE PANEL RIGHT<br>(MAIN)     | R50 01 4 085866 | 55     | SCREW, PHILIP PAN HEAD<br>M6x15mm     | R07 01 4 010157 |
| 27 | STRUCTURE, BACK L/R                  | R01 01 4 083991 | 56     | WASHER, SPRING                        | R07 04 4 003769 |
| 28 | PANEL, RIGHT ORIFICE                 | R01 01 4 083986 | 57     | WASHER, FLAT                          | R07 01 4 003768 |
| 29 | PANEL, LEFT ORIFICE                  | R01 01 4 083985 |        |                                       |                 |

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